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# HOME WALKS
AND
# HOLIDAY RAMBLES

BY

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# PREFACE.

THE Author's main object in this volume is to add one to that useful class of works which, being neither essentially technical, nor prominently bringing forward either marvels or rarities, treat the subject of natural history as an intellectual out-of-door amusement. The incidents are not exciting, and may occur to anyone who lays himself in their way by rambling in his garden or the adjacent country; the facts recorded do not claim the title of discoveries, and may be verified by the student in any branch of natural history who possesses, and knows how to exercise, the use of his senses. Scientific descriptions and technical terms are avoided; though the Author has added the systematic names of plants and animals whenever such addition was judged necessary to the identification of species. Notes on such common objects as wayside insects and the birds which frequent our gardens and groves may not excite wonderment, or gratify a taste for novelty like the fictitious histories of boy-adventurers now so common; but

they are calculated to have a healthier effect on the minds of young people. They may induce the lover of nature to verify by personal observation statements on matters within his own reach, and so encourage and foster a taste for natural history. The very minuteness of the facts recorded may serve to intimate that much yet remains to be noticed, and tempt the young student to add to his own stock of information by making similar notes for himself. Although not marvellous, they are real, and accurately recorded. A few scraps are introduced, taken mostly from works which are either of unusual occurrence, or are rarely consulted by other than professors;—this, however, not with the object of superseding personal observation, but simply of affording variety by contrast.

WINTON HOUSE, near WINCHESTER:
*July* 1863.

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# HOME WALKS

AND

# HOLIDAY RAMBLES.

*January* 1*st*, 1861.

We have been much amused during the last few days in watching the manœuvres of some birds in the garden—Tits of two kinds, and Nuthatches.

I had suspended two walnuts by strings, each about a foot long, from the twigs of an apple-tree which stands close to my dining-room window. A Blue and a Great Tit were the first to discover the treasure, and lost no time in helping themselves. Before suspending the nuts, I had removed a portion of the shell in order that my expected guests might the more easily rifle them. This assistance I have found by experiment unnecessary, but I was willing to save the hungry birds a superfluous expenditure of their strength. From time to time one or other of the Tits might be seen clinging

to the nut, greatly enjoying the banquet. The Blue Tit, though much smaller than the other, was generally allowed to be the more courageous of the two, as he frequently drove away his big brother, while the latter never ventured near when the ground was occupied. The usual method of both Tits is to cling to the nut back downwards, and pick out small morsels of the kernel, which they devour on the spot. In case of a larger bit being broken off, the bird flies off with its prize to a neighbouring branch, and discusses it at leisure, a Robin or occasional Hedge Sparrow often picking up the crumbs which have fallen to the ground.

But a Great Tit, endowed with a mechanical turn, has appeared on the scene. He has perhaps found the inverted posture in eating to interfere with digestion; so he has adopted the plan of perching on the twig and pulling up the string as cleverly as a sailor would haul in a rope. For this purpose he on one occasion was observed to employ one of his feet in pulling up the string, the other being occupied in securing and pressing beneath it against the twig each turn as it was *handed* in. His usual method is, however, to haul up the string with his beak and to place it, turn by turn, under his feet. The nut thus gradually rises to the twig on which he is standing, and he then feeds away at his leisure. It is a solitary bird, I think, which adopts this plan, for though I have seen two at once engaged about the same nut, one clung to the nut itself, and while he was thus occupied another perched on the twig and proceeded

to pull up the nut with his fellow attached. He soon desisted, however; for what reason I know not. Perhaps the weight overtaxed his strength, or he shrank from the prospect of a battle, which would certainly have ensued before the one actually in possession relinquished his claim.

A Nuthatch came on the field yesterday, but was unsuccessful; his engineering powers did not conceive the possibility of pulling up the nut to the twig, nor did he cling to the nut itself. Once or twice I saw him alight on the string head downwards, his favourite attitude, and deal some smart blows at the nut; but as the latter made no resistance, in consequence of its being suspended freely, he could gain no hold on it, and soon retired.

This morning I saw two Nuthatches at once creeping about the tree; and for their particular benefit I fastened two walnuts by a strong pin to the trunk of the tree, and retired. I had scarcely resumed my station in the house when one of the birds discovered the prize, and in the course of a very few minutes had by repeated blows, the noise of which I heard distinctly through the closed windows, broken the shell and regaled himself at his leisure. Another made an attack on one which I left on the ground; after a few unsuccessful blows he contrived to remove it to the base of a tree, but being unable to fix it there, or having made a hole in it to serve as a holdfast, he carried it off bodily.

*Holkham, Norfolk, January 3rd.*

When I left London yesterday evening the air was thick and muggy, light rain was falling, and the roads were of the specific colour of London snow after a two days' thaw. About 7 o'clock we fancied that it was growing colder; the sky was then clear, and the stars were shining brightly. At 8 o'clock we knew for certain that winter had resumed his sway, the platform of the Wymondham station being coated with ice. The 'Times' of the preceding day contained the following paragraph:—

'WILD FOWL.—During the present week, a very unusual number of birds, consisting of wigeon, teal, coots, moorhens, snipes, &c., have flocked over the Thames and the adjoining marshes as far up the river as the Victoria Docks. Yesterday morning no less than seven snipes were brought down by one shot at Lower Charlton marshes, and the number of birds bagged during the week in the vicinity of the river from the Lower Hope to Blackwall, is stated to be quite unprecedented.'

The continuance of the frost, therefore, was to me, who wanted to fall in with some of these flights of birds, a matter of congratulation. This morning H. and I sent on our luggage from Wells (our destination last night) to Holkham, and with our guns in our hands made for the same place along the seashore. Walking on the highway road was a work of peril. The snow had been worn into a caked surface by the traffic, it had then partially thawed, and last night's frost, which was very severe, had coated the whole with a sheet of ice. The wind, from the N.E., was sharp, but the sun was bright, and the excitement of a holiday generated a supply of heat from within

sufficient to resist any amount of cold, so that before long we began to wish we had left our greatcoats.

Our way lay along a high embankment stretching from Wells to a line of sandhills, through which we were to work our course to Holkham. We saw several flocks of Sanderlings and Ringed Plovers; but our object not being that of the cockney sportsman, to shoot 'seven Snipes at a shot,' but simply to obtain enough specimens to identify the birds which we met with, we did not interfere with their, I fear imperfect, attempts to find food among the frozen sludge. A party of small birds, however, somewhat puzzled me; they appeared to be Pipits, but instead of showing the green tinge which they wear at this period of the year, they seemed to both of us to have a reddish hue. Having suffered several to pass me without firing at them, I at last shot one, which appeared strongly tinged with purple. On picking it up I found it was a Greenfinch, and a brightly coloured one. Though this was not the same bird that I had seen before, I had now no doubt that the doubtful birds were Pipits, and their red hue was an optical deception, owing to some peculiar refraction which, in the glare of the snow, showed green by its complementary colour red.

We noticed among the sandhills a mass of feathers, where some bird of prey had evidently been making a meal. To what bird the feathers had belonged I unfortunately omitted to ascertain, as I shortly afterwards fell in with the marauder.

Still passing through the sandhills, I caught a

glimpse of a large bird, which disappeared behind a hillock, but rose again before we were within shot, near enough to us, however, to be pronounced an Owl of some kind. Our common Brown and White Owls fly only by night: but this flew not in a scared uncertain manner, as if light perplexed it; on the contrary, it was as much at its ease as any bird that can be named. Its mode of flight resembled that of a Lapwing Plover more than anything else. We soon found that there were several of these birds beating about the long grass of the sandhills for game, their food being, I suspect, on this occasion, not field mice, as is said to be usually the case, but the half starved birds which resorted hither for shelter. We proceeded quietly, and before long an Owl got up from behind a sandhill close to me, and was soaring upwards preparatory to sailing off before the wind. My shot was successful; and we had the satisfaction of picking up and subsequently examining a fine specimen of the Short-eared Owl.

Any bird that passes its summer in the Arctic Regions, whether it belongs to a nocturnal or diurnal genus, must of necessity hunt by daylight; or during the long northern summer it must altogether abstain from food. This Owl, consequently, driven southwards by excessive cold or scarcity of food, naturally retains its old habits, and hunts by day. According to ornithological books, its food is said to consist principally of field mice. This I think questionable. Field mice do not come abroad much by day; they are not, I believe, abundant in high latitudes, and

the talons of this Owl seem stronger than is requisite to capture such 'small deer.' My guide through the Brancaster Marsh told me, in answer to my enquiries, that there were no Owls among the sandhills there, 'because there were no rabbits.' The sandhills near Holkham abound in rabbits; and I have little doubt that his common-sense view of the case is the right one, namely, that the Short-horned Owl in England resorts to rabbit warrens for the sake of what it can capture, be it rabbits or birds. In high latitudes it probably feeds mainly on lemurs.

The condition of the ground over which we travelled was most singular. In some places the snow-drifts were so entirely covered with sand, that the crunching noise of the snow alone betrayed what we were treading on; in other places the ground looked like salt sprinkled with pepper; and everywhere, instead of yielding soft sand, which makes walking over sandhills so fatiguing, we had hard solid footing. The salt ooze was frozen hard enough to walk on, and high-water mark was often a ridge of frozen foam.

I noticed here and there a phenomenon, reflection on which might help geologists to account for some of the appearances in stratified rock which have hitherto puzzled them. This was a perfect circle, defined by a narrow and shallow depression in the sand, with a stalk of grass in the centre. It had been formed by the wind blowing from various quarters, and acting on a curved rigid leaf of Elymus geniculatus. The base of the leaf being attached

had remained motionless, but the point had traced first one portion and then another of a circle, until the whole was completed. Frost had then set in and the described figure was fixed. If, before a thaw sets in, some convulsion of nature covers the spot with sand of a different colour or with mud, and the whole be in time converted into rock, the future geologist will not find it easy to account for a

geometrical figure being traced on the upper surface of the lower, and the lower surface of the upper stratum. In one instance the stalk had disappeared, and the circle only remained. On many parts of the shore the sand, marked with the ripple of the receding tidal wave, was frozen hard, closely resembling the specimens preserved in geological museums.

During my walk I once got near enough to a Red-

shank, to observe it throwing its head back to give force to the repeated blows by which it endeavoured to break through the crust of ice in the frozen mud, in order to probe for insect food in the soft soil beneath.* We were nearing Holkham when H. observing some small birds blotched with white, shot one of them, and we were pleased to find it to be a fair specimen of the Snow Bunting.

Thus, in our first morning, we procured two birds of which we had hitherto only seen preserved specimens. After lunch we went into the meadows skirting the sandhills and saw several small parties of Ducks; but as these appeared to be flying from Lord Leicester's preserves we did not meddle with them. We saw also a few stray Ducks which kept at a respectful distance from us, a Royston Crow, and a large flock of Starlings. As it grew dusk, we heard the croaking noise as of a large flight of birds high in air, and tracing the sound with our eyes, saw a long string of Bernicle Geese, making seawards. Several flights of Ducks came in from the sea and passed overhead, and when we approached our hotel the report of my gun discharged was answered by a general quacking from all parts of the marsh.

## *January 4th.*

Another bright frosty day, pleasanter than yester-

* Macgillivray endeavours to throw discredit on the statement that the Redshank uses its bill like a hammer in penetrating the hard crust of a mud bank; but I have no doubt as to the species of the bird observed on this occasion.

day, it being quite calm. We made at once for the shore, and having walked along the sand for some time without seeing any birds, crossed the sandhills, and got into the meadows. There were large flocks of Starlings and small parties of Fieldfares which came tolerably near to us; but the few Waders which we saw (apparently Ringed Plovers) whistled pleasantly as soon as they saw us appearing, and withdrew. After having gone about three miles we came to an embankment with a causeway on the top of it, leading to a village, Burnham Overy. There were a good many Larks and Grey Plovers on the frozen mud, but the latter were unaccountably shy.

Looking seaward, our attention was arrested by a waving line of white in the front of a dark cloud—a company of Geese, flying along the shore at a safe height, and over or beyond the line of breakers. As their wings alternately reflected and lost the rays of the sun, the appearance they presented was not unlike a thread of agitated quicksilver. This line was followed by another and another, till we counted five, all at about equal distances, and proceeding in the same direction eastwards. We could not help comparing them to troops marching in review order by companies before the inspecting officer.

As we approached Burnham Overy, we saw a party of about a dozen men on the ice, conducting themselves in a most mysterious manner. Each of them held in his hand a long and slender pole, which he kept thrusting obliquely through holes in the ice. As we drew nearer we found that each pole had a

Winter Fishing in Norfolk.

trident at its extremity, and every man carried a bag. One of the party, who was armed with a hatchet, cut holes here and there, through which the trident was inserted and thrust into the mud. We supposed they were trying to catch eels or flounders, and that the bags were intended to hold the spoil; but the latter hung very flaccid, and nothing was caught while we were looking on. The only birds we got to-day were a Dunlin and a Ringed Plover. As we returned we kept close to the water's edge. Ducks were in great abundance, riding at their ease in paddlings of a dozen or more on the smooth water, just outside the breakers; we supposed they were waiting for evening, when they intended to wing their way inland to feed. We observed also two or three Divers; they were fishing in the shallow water, hardly beyond the line of breakers. Towards dusk we saw several small flocks of Ducks flying over the meadows, looking out for convenient feeding ground; they were not so accommodating as to allow us to discover their species.

The Ring Plovers are less inclined to keep in flocks now than they were in autumn. The Dunlins have not altered their habits.

*January 5th.*

Frost still continuing, but the sky overcast. We sallied forth about ten o'clock, walked a mile and a half along the road, and then made across the

meadows for the sandhills. We saw very few birds until we reached the broad piece of land recently reclaimed from the sea by the Earl of Leicester. Large flocks of Larks were flying about and alighting in the watery places to feed. Among them we saw several Snow Buntings, far more conspicuous to-day by their white wings than they had been a few days since. Not that there was any increase in the proportion of white, but when the sun was shining there was little contrast between the white and dark feathers, both of which reflected light; but to-day in the absence of the sun, the plumage of the Larks was of a sombre hue, that of the Buntings snow-white. There were also numerous large flocks of Linnets distinguished by their small size, blunt heads, short jerking flight, and twittering note. A shot at a flock brought down three, which proved to be Mountain Linnets, marked by the dark wine-red plumage of the lower part of the back, the yellow beaks, and black feet. We tried for a long time to get another specimen of Snow Bunting, but failed. A thaw had set in, and the birds, though attracted to the marsh by the prospect of finding food in the softened ground, were shy.

Drove this morning from Holkham to Brancaster, having first requested the landlord of the hotel at which I had been staying to purchase for me a Wild Goose, if any more should happen to be shot in the marshes. Reached Brancaster about noon, and after luncheon, sallied forth to explore the new ground. We enjoyed here an advantage which was unattain-

able at Holkham, in that we could go where we liked and shoot all creatures *ferœ naturæ* that came within our reach; whereas at our former station, owing to the proximity of preserves, we were obliged to confine our operations to the seashore, the sandhills, and their immediate vicinity. We had also the advantage of a guide, who not only led us where we most certainly should have never ventured alone; but, having been born in the place, and having been all his life accustomed to carry a gun, was well acquainted with all the kinds of birds which are worthy of being shot for food. He could tell us something about their habits, and from long familiarity could distinguish the majority by their flight or note. He was an active, intelligent lad, of about eighteen years of age, and was accoutred in a pair of long boots, of which we soon discovered the utility.

We proceeded at once to the seashore, which was distant only a few hundred yards from the house of the kind friends with whom we were staying. Here we found that we had to get into a boat in order to be rowed across a narrow creek which separated us from the marshes which we were to explore.

Yesterday's thaw had ended with the day; snow had fallen in the night, and the ground was again frozen. As we approached, a flock of birds, which our guide called Stints, were pecking among the mud. At these, as they rose, H. fired; but this being his first essay at firing in a boat, he not only missed his mark, but failing to make allowance for the recoil of the gun, narrowly escaped taking his seat on the gunwale

of the boat. This would have been an unpleasant beginning of our sport; for such a descent would most probably have been followed by a somersault backwards into the water, the loss of a gun, and a frozen coat. Having escaped this peril, we landed on the ooze, and with a few steps gained the frozen surface of the marsh, which was elevated a few feet above the surface of the water, and thickly covered with Sea Orache (*Atriplex*) and Sea Lavender (*Statice*). The birds which we were likely to find were, on the authority of our guide, Redshanks, Grey Plovers, Stints, and perhaps a Duck.

Our course was at first clear enough. We had to track our way across the plain, safely trusting our feet wherever there was vegetation, and springing across narrow creeks three or four feet wide, the banks of which were made firm enough by the roots of the marsh plants; but which, being several feet deep, and having either water or mud at the bottom, would have been most unpleasant to fall into. These creeks gradually became wider, so that I often diverged a little from the line to select a favourable spot for a leap. Soon we came to one far too wide to be attempted by this mode of transit; whereupon I concluded that our course must be to trace it to its extremity. Our guide was of another way of thinking. With the words, 'O, it will bear very well,' he made a stride in advance. I expected to see him disappear. Not so; he calmly stalked on, sinking a few inches into the mud, stuck his toe into the opposite bank, and sprang up. There was nothing

to do but to follow, which we did, though somewhat more cautiously, and, consequently, sinking deeper. We passed, however, with no more damage than muddy boots; and I had scarcely done congratulating myself that we had surmounted this peril than we encountered a second and a third and I know not how many more, all precisely similar, except that there was some little variation in the amount of sliding which constituted the first step. Looking out for birds had ceased to be our principal object: the question with me now was how to avoid 'creeks,' or, if creeks were inevitable, how safely to cross them. Our guide gave us no great hopes of success, because the Redshanks, of which we were supposed to be in quest, resorted to the tidal creeks, and these were now full of water. We saw, indeed, several, but they always rose out of shot, owing, perhaps, to our awkward floundering through the mud, when we ought to have crawled stealthily. I had full opportunities, however, of learning the note of the Redshank, which I had hitherto confused with that of the Ringed Plover. Still this did not make amends for the toil of crossing *crevasses* of mud without making any ascent; so I found myself tracing the course of a creek to its narrow extremity, satisfying myself that I wished to discover whether there were any Snow Buntings among the Larks which I saw flying about some sandhills in the distance. The rest of the party gradually worked up towards me, and begged me to return to the main creek, where alone there was a chance of finding any birds. With

no good grace I assented, and speedily found myself again involved in a reticulation of creeks as before. We now heard a shot not far from us, and saw a Wigeon flying away seawards, and presently, when we reached the main tidal creek, were hailed by a youth in a boat, who, armed with an ancient fowling-piece, an iron tube fastened to a log of wood by a strip of tin or copper, I forget which, bewailed his having missed the Wigeon, which 'he ought to have killed, and should have killed, if he had not shown himself too soon.' He brought his boat to land, or rather to mud, and expressed his intention of going with us, as he had nothing to do. I now proposed leaving the marsh, of which I had seen enough, and making for the sandhills and seashore. The new comer was very talkative, and was soon on familiar terms with us, describing to us the various birds shot on the marsh, and breaking in on every pause in the conversation by lamenting the loss of the Wigeon which he 'ought to have shot, and which he should have shot, if he had not shown himself too soon,' or 'if it had not been for that other man in a boat who came up just at the wrong time.' On reaching the sands, we found the tide high, as indeed we expected; but it was growing dusky, so we turned homewards, but not by the way of the 'mash,' having obtained specimens of a Gull and a few Dunlins only, but having learned the notes and local names of many of the birds of the coast.

On the way the unsuccessful Wigeon-shooter was eloquent on the success of his relatives in Duck

shooting; so I begged him to bespeak for my inspection all the Ducks that might be shot in the neighbourhood during the next few days, promising to purchase nine brace at least, and to pay a few pence above the market price for each.

*Mem.* Never again to explore Brancaster marsh unless accompanied by a staff of guides, provided with ladders, ropes, and restoratives.

*January 7th.*

My offer of a premium of a few pence for all sea-birds brought to me, was most effective. Yesterday the weather was very severe, and much snow fell in the night. When I came down in the morning, a large tray full of Ducks and Waders awaited my inspection—a list of which I shall give below, with others brought to me on the two subsequent days.

Towards afternoon the weather cleared, and we sallied forth with our guns towards Deepdale marsh—a large meadow, surrounded by an embankment. We saw, however, little to interest us, except for a few minutes, when the sun shone out, and tinged with a lovely roseate hue a range of sand-hills seaward, which were lighted up with great beauty in front of a mass of leaden clouds. As we returned, we met several men setting out on a Duck-shooting expedition. Each man carried a gun, a spade, and a canvas bag filled with straw, his intention being to dig a hole in the mud at the side of a creek, and to sit in it on his wisp of straw in wait for Ducks—terrible work these bitter nights, but better than idleness and starvation: for

all the regular occupation of the villagers, whether as fishermen or in unlading vessels, is at a stand still.

As we passed through the village of Deepdale, we went into the church to see a fine old Saxon font, the history of which reflects no great credit on a former incumbent of the parish, whose name may better be left unrecorded. He had, it seems, sold the font to a gentleman who wished to employ it as a decoration of his garden rockery. By him it had been passed on to a gentleman in Cambridgeshire, who placed it in his conservatory; but, for some reason or other, he had grown tired of it, and had removed it into his garden, where it was traced by the order of the bishop, and found in several pieces. A clever workman was employed to cement it together again; and he, assisted by the memory of some of the older inhabitants, so far restored it, that with fair dealing it will remain for centuries a handsome appendage of the church.

This evening my kind hostess handed to me a china saucer, containing an inverted tea-cup, and asked me to guess what was beneath. My eye was caught by some greyish substance which extended beyond the rim of the cup, which corresponded so exactly with the materials of Mr. Gould's Kingfisher's nest, now in the British Museum, that I replied without hesitation, 'A Kingfisher's nest.' The cup being lifted, the identity was indisputable. It had been found more than twenty years ago, in the embankment which we had that afternoon traversed, and consisted, without any admixture of dirt, of

small fish-bones, and portions of the shell of shrimps. Eggs had been found in it, pure white, polished, and nearly globular, three of which were still preserved.

*January 8th.*

Our guide of the 5th was in waiting for us, by appointment, this morning at ten o'clock, when we sallied forth for a day on the sands. Frost very severe. While dressing this morning, I laid down my sponge for a minute or so on a piece of damp flannel, and when I took it up the two were frozen together; the water in my bottle sparkled with spicula of ice, and ice shot up the sides of the tumbler as I held it in my hand. The cold being so severe in an inhabited house, and in a room in which a good fire had been burning six or seven hours before, it is not surprising that out of doors it was something out of the common. The air was still, the weathercock pointing to the south—not an unusual quarter for the wind, I was told, during a frost in Norfolk; a thick white fog enveloped the whole landscape, and being condensed on the twigs of the trees, covered them with feathery rime. In a few minutes my beard and whiskers had turned prematurely grey; and one or two chubby-faced boys whom we met were strangely disguised by their flowing silvery locks. A walk of two miles brought us to the sea-shore, where winter reigned with an austerity unprecedented in my experience. Unsullied snow covered everything, down to high-water mark; there began crisp rugged sheets of par-

tially thawed snow, frozen into a mass with salt-water. Banks of drained sand were frozen hard; where the sand lay rippled in form the little pools were glazed with ice, and the very waves washed in ice in a mashed condition.

The number and variety of birds were marvellous. Not only did we see, almost constantly, Ducks, Geese, Gulls, and Waders of many kinds, but many of the purely land-birds, having deserted the inland meadows, were picking up a scanty subsistence close to the very water's edge. On one occasion we saw two wild Swans, on another a flock of them flying in a line close to the surface of the sea. Our guide pointed out to us, as they flew, Wild Geese (Pink-toed Bernicles), Brent Geese, Black Ducks (Scoters), Mallards, Mussel Ducks, Grey Plovers, Sea Pies, and Redshanks. But of all the birds which we saw, Dunlins were the most numerous. Many of these were so fearless that they allowed us to come within a few yards of them, as they ran along close to the water's edge, not unaffected indeed by the severity of the weather, for occasionally we saw one hobbling along as if one of its legs was gouty.

About noon, the sun made a way for itself through the mist, when, looking seawards, we saw columns of mist floating majestically away, and at the same time a frostbow appeared, resembling in all respects a rainbow, except that it was of a lustrous white. This phenomenon, I was afterwards told, sometimes lasts for many hours. To-day it disappeared in about a quarter of an hour.

The sunshine not only cheered us, but greatly enhanced the beauty of the scene. The effect on the appearance of the sea-birds was magical. At one time we saw in the distance, several miles off, a light cloud, as of smoke from a factory chimney; it moved rapidly, suddenly disappeared, and as suddenly again became visible. This was an enormous flock of Dunlins, consisting of many thousands at least. They did not come very near us: but smaller flocks, which flew about in our immediate vicinity, presented a similar appearance. When the upper surface of their bodies was turned towards us, they were of a dark hue; suddenly they wheeled in their flight as if the swarm was steered by a single will, when they disappeared, but instantaneously revealed themselves again, flying in a different direction, and reflected a glittering snowy white. Mixed with them in the same flock we repeatedly saw Sanderlings, purple Sandpipers, and Knots; and occasionally they became confused with a few Grey Plovers and Redshanks. Most of the other sea-birds flew in a more or less perfect line, straight or wavy, or in two lines meeting at an angle, and cleaving the air like a wedge. Our guide could distinguish most of these by their note. That of the Dunlin I was soon familiar with, a querulous piping. The notes of the Grey Plover, Redshank, and Oyster Catcher, have in them more of a whistle, different each from that of the Curlew and Ring Plover, but not easy to define. The attempt made by some ornithologists to denote them by combinations of the letters of the alphabet is simply absurd.

The human voice is not the instrument to express them, nor can any combinations of letters give the key-note or modulation. To be known, they must be heard and remembered; and if any attempt is made to imitate them, articulate language must not be the medium.

A flock of Red-legged Gulls ('Pigeon Mows—that is, Mews,' our guide called them) offered a very pretty sight. They had detected either a schull of small fishes or a collection of dead animal matter floating among the breakers, and were feeding with singular activity. They alighted on the water instantly that a wave had broken, remained there a few seconds, and, when a succeeding wave seemed on the point of breaking over them and overwhelming them, clapped their wings two or three times, rose just far enough to allow the wave to pass under them without moistening their beautiful dove-coloured wings, but no farther, and alighted again to be disturbed in like manner by the next breaker. As we drew near they all flew away, and we could discern nothing, where their keen eyes had probably detected food in abundance.

These Gulls and two other kinds feed, however, for the most part on shore, keeping fellowship with Crows, Jackdaws, Royston Crows (called here Danish Crows), and several kinds of Waders. These were sometimes seen in masses crowding the places where some receding wave had swept in a mass of echini, mussels and other shell-fish. With them, too, were associated Larks, Pipits, Thrushes, Fieldfares ('Fulfurs' our guide called them), and Redwings. Fieldfares,

usually so cautious, allowed us to approach within twenty yards of them. Larks were converted into Waders for the occasion, running along even in the water, or alighting on the muddy rocks out at sea, over which every advancing wave rippled.

Lesser Terns (called here 'Shrimp Catchers,') frequent this coast only in summer, and at that season are among the most attractive of sea-side objects. Their habit is to fly over shallow water (either tidal pools or the surf), to stop occasionally, and hover until they have descried some prey beneath them, when they drop with a splash, capture their ill-fated booty, and soar again. They breed on this coast, laying their eggs among the shingle, and take their departure in autumn. The Ring Plover lays its eggs in similar localities, but the Redshank deposits its eggs under the shelter of a 'rosemary bush'—Sea Blite (*Suæda fruticosa*). Dunlins never breed here, but assemble in small flocks early in autumn, and join into larger bodies in winter.

We had walked several miles along the sands, when we reached the mouth of Old Thornham Harbour. There we saw several flights of Brent Geese, which, we were informed, resort greatly to this particular spot; but we found the inland wind so keen here that we thought it prudent to beat a retreat. Hitherto a ridge of low sand-hills had given us some shelter, but here the sharp wind swept unbroken over an extensive plain of mud, filling our eyes with tears and freezing our fingers.

As we returned we were overtaken by flocks of

Oyster Catchers, flying in long broken lines all in one direction, and repairing, as our guide informed us, to the east point of Brancaster Marsh, where they spend the night.

Evening was drawing on. A brass sun in a copper sky gave intimation of another hard night; so we bid adieu to Brancaster sands, and thought over all we had seen to-day, and of the comfortable fireside which awaited us.

I met this evening a gentleman, who well recollected the times when the Bustard was to be found in Norfolk. They were usually seen in the middle of the large unenclosed plains in which the county formerly abounded, and in such situations he had himself seen them. The last occasion was somewhere about the year 1825, when he once or twice had a shot at them, but could never get near enough to bring one down. When disturbed, they moved off rapidly, employing both their feet and wings; rising heavily, at an angle so acute, that they advanced perhaps a hundred yards before they attained the height of a man. When once on the wing, they flew swiftly. They formerly bred in the parish of Deepdale; and he could himself recollect an instance when an unsuccessful attempt had been made to rear some in captivity from the eggs.

The Dotterel, he also told me, was once tolerably frequent on the shore, being seen in small flocks. This was formerly a bird of no unusual occurrence; but, like the Ruff, has become rare, in consequence of being much sought after for the table.

*January 9th.*

To-day had been fixed on for our return home. So severe, however, was the weather yesterday, and such the state of the roads, that the railway trains had not come in at Wells during the day, and there had been no mail between Doncaster and Lynn, coming or going, for the day. Such being the state of affairs, I needed no great amount of persuasion to remain in my comfortable quarters for another day, which, being bright and pleasant in spite of the cold, I determined to spend as I had yesterday.

The snow was not thick on the flat ground between Brancaster and the sands, having been drifted into the drains and hollows in the ground. We had nearly reached the sand-hills, when I saw, on a bank of snow some thirty yards ahead, a Snow Bunting, which I fired at and wounded. In my eagerness to secure it, I omitted to calculate the depth of a trench between me and my prize, rushed into it, and all but disappeared. I quickly, however, scrambled up the bank, with the temporary loss of my spectacles; and in the meanwhile my bird, which I had lost sight of, was picked up.

The scene on the sea-shore was much the same as yesterday. We happened, however, to hit upon one particular part of the sands just at low-water, and gained a satisfactory explanation of a remark made by my guide on the previous evening, as we were on the point of leaving the shore: 'That Crow will have to go home without his supper.' This was explained

at the time to mean that the tide would not recede from the 'scarves' before night, and consequently that the Crow would not be able to pick his supper from them, as perhaps he expected. We now found what the 'scarves' were.

At some remote period, this part of the coast of Norfolk was thickly covered with wood, which extended over a considerable portion of land now encroached on by the sea. The mud rocks, which I have mentioned before, are actually the remains of an ancient forest, and consist entirely of vegetable substance,—in some places decomposed, in others retaining imbedded in them the stumps and roots of large trees as they grew. Of this I had ocular demonstration, and brought away pieces of wood softened by age and saturation with water, but genuine, unmistakeable wood. This portion of the coast is covered at every flow of the tide, and, indeed, at neap tides is never uncovered. The soil being soft, yet stationary, affords a harbour for mollusks and sea-worms, but the surrounding sand is liable to be shifted, and is therefore barren of animal products. Of this fact both sea and land birds are well aware, and resort hither in thousands to feed. We fell in with a party of gunners who had stationed themselves here to wait for sea-fowl, and saw for ourselves great numbers of birds of many kinds making the best use of the short time at their disposal; among others a Kestrel, the latter not in quest of worms, but dancing attendance on the Dunlins, on which my guide told

me he had many times seen one launch. Larks were still among the most fearless of land-birds, remaining on the ground until the tide rose and covered the scarves under their feet. One Lark we observed fly right out to sea, as if it were going to make for the coast of Holland. When it had gone some distance beyond the last of the breakers it seemed, however, to have discovered that there was no footing to be obtained in that direction, and altered its course landwards.

During the walk, I had the good fortune to shoot a female Scaup Pochard, as it rose from an unfrozen piece of water inside the sand-hills. This bird is locally termed a Mussel Duck, the male being called a Smee. A few only of these birds are obtained on the sands, the majority being shot by liers-in-wait on the marsh. On moonlight nights the men in quest of them frequently stay out all night. On dark nights they shoot them in the evening, or early in the morning; that is, as they are going to and returning from their feeding ground. My guide had been out on the night of the 7th inst., and had waited for three and a half hours without getting a shot. The weather was too calm: it is during a snow storm or high wind that the sport is most successful, either because the birds are then less wary, or fail to discern their enemy. Many are shot by men who go about the creeks in a small flat boat, impelled by a paddle with a blade at either end, which is dipped alternately, first at one side and then the other:

When I came to pack up my stores next day, I found that I had obtained specimens of a Pink-footed Bernicle (sent by the landlord from Holkham), Brent Goose, Merganser, Mallard, Scaup Pochard, Red-headed Pochard, Wigeon, Gold-eye, Gull of two kinds, Curlew, Godwit, Grey Plover, Redshank, Knot, Purple Sandpiper, Sanderling, Dunlin (locally termed a 'Stint,' a name which appears to be common to many other birds of the same size), Ring Plover, or 'Stone Runner,' Short-horned Owl, Snow Bunting, and Mountain Linnet, none of which are attainable in Herts.

In the mercantile phraseology of Norfolk, a Mallard is a 'duck;' a Wigeon, Smee, or Mussel Duck, a 'half duck;' a Curlew (pronounced calúe), a 'quarter duck;' and a Godwit, a 'half calúe.' The price of a duck is 1*s.* 6*d.*; of a half duck, 9*d.*; of a calúe, 6*d.*; of a Godwit, 3*d.*; and Stints—that is, the small Waders —are sold to the dealers at 6*d.* a dozen. Of these last many are sent to London, and retailed at a high price under the comprehensive name of 'Larks.' The Curlew and Godwit are considered delicate eating.

*January* 13*th.*

*A London Fog.*—This morning, the barometer standing at 29·91, the thermometer 44°, and the wind from the east, but light, I happened to be travelling on the North Western Railway to London. The sky was overcast and the atmosphere hazy; but during my walk to the station (twenty miles from London) and the first ten

miles of the railway journey, the day was of the average brightness; at least, I remarked nothing unusual. As the train approached Harrow a sudden decrease of light took place, and as the carriage in which I was riding was near the engine, I imagined that the gloom was caused by smoke proceeding from coal, which is occasionally used on this line as fuel instead of coke. Looking out of window, I noticed that the horizon towards the SW. was obscured by a bluish-black bank of cloud of a deeper hue than I ever remembered to have observed. At five minutes before 11 A.M. the train stopped at Harrow, when a gentleman got into the carriage, to whom I remarked, looking out towards the SW., 'I fear a heavy storm is impending; I think I never saw so black a sky.' He assented, and immediately the train started. I happened to be reading the 'Times;' but as the gloom increased, the paper lost its whiteness, and in the course of a few minutes, finding some difficulty in making out the small type, I confined myself to the large print. This too presently grew dim, and at five minutes past eleven all power of reading was gone, so I folded up my paper, and, not without some feeling of alarm, sat still, waiting for what was coming. Still deeper and deeper grew the darkness. I unfolded my newspaper again to test the degree of obscuration, and found that I could no longer distinguish even a letter of the large capitals at the head of the paper. The air in the immediate neighbourhood of the train seemed to be tolerably clear, but above us there was evidently some dense mass

which completely shut off every ray of sunlight. To all intents and purposes it was night. We passed into the Primrose Hill tunnel, where, of course, the darkness was complete, there being no lamp in the carriage; and as we emerged, the only perceptible difference was occasioned by the firelight in some engines near the station. I had to deliver up here half of my return ticket, which I had torn in two; but I was utterly unable to distinguish the blue half from the red, even when I held it sideways at the window to catch as much of the artificial light as reached me. I was able only to trace the outline of its shape, and even this I could not do when sitting back in the carriage. I held it in my hands a few inches from my eyes, but could see neither it nor my fingers. I could barely discriminate against the sky the line of roof of the adjoining buildings; the sky itself wore the hue of what one would call a very dark winter's night. The hands of the illuminated clock about fifty yards off pointed to ten minutes past eleven, and I could still see pretty clearly the light of an engine about a hundred yards off; so that the gloom was undoubtedly caused less by the density of the surrounding fog than by the massive canopy of mingled fog and smoke above. The ticket-collector now came with his lantern, and in answer to our enquiries informed us that the darkness had lasted about ten minutes, and, he thought, would soon pass away. In the course of a few minutes more we were at Euston Station. By this time the intensity of the darkness was gone. It evidently had not been of

long duration here, for the porter had not yet finished lighting the row of lamps which runs along the edge of the platform. Nothing remained but a common London fog, with the usual taste and smell, and a clay-coloured sky overhead. I had made up my mind to remain at the station rather than risk in the streets the perils of so untimely and unnatural a night; but in the course of a very few minutes it grew tolerably light, and in the afternoon the sun shone out from a clear sky.

I afterwards heard that the fog had extended over various parts of London, and the fact was noticed in the newspapers of the following day; but I could not find that it assumed anywhere else the night-like character which it bore north-west of London.

I have noted down these particulars without overstating or exaggerating a single incident.

*February 15th.*

A heavy fall of snow four days since, followed by a severe frost, has made it difficult for the smaller birds to obtain a supply of food. At such times an excellent opportunity is afforded to anyone who wishes to study the tempers, habits, and attitudes of birds. Woods and fields failing to supply their requirements, they draw near to gardens and houses — the tamer kinds attracted, perhaps, by old recollections, while those which under ordinary circumstances are shy and retiring cannot resist the temptation of joining company and making common cause with any

bird actually engaged in the delightful occupation of pecking at unmistakeable food. The consequences, therefore, of throwing out a plateful of scraps before the door are, first, that a Robin makes his appearance in the land of plenty at once, and immediately sets to work to satisfy the cravings of hunger. But before Dicksy has picked up many morsels, Flapsy has discovered whereabouts a meal is to be procured for the trouble of collecting, and hastens to the banquet. The two birds, though hitherto not exactly sociable, have been well content to leave each other unmolested; now, however, that there is but one feeding-ground for both, the fact is sufficient to make out a *casus belli*. Dicksy neglects his crumbs, and with swelling breast and ruffled feathers pounces like a fury on the intruder, who, not being learned in the law, refuses to admit the claim of prior possession; and being moreover no less stout-hearted than his opponent, yields no point, and does battle valiantly. A half-starved Chaffinch, chancing to fly overhead, observes the combatants, and wisely concludes, that in times so hard as the present, the only thing worth fighting about must be something eatable; so he drops with a semicircular sweep into the nearest tree, and having taken a brief survey of the battle-field, descends for a share of the spoil. Forgetting their animosity, the two combatants desist, and attack the new intruder, who, in spite of his heavier bulk and more powerful beak, is not without terror of a flaming red breast; so with thief-like haste he snatches up a crumb and retires to a short distance — resuming the charge, however, from

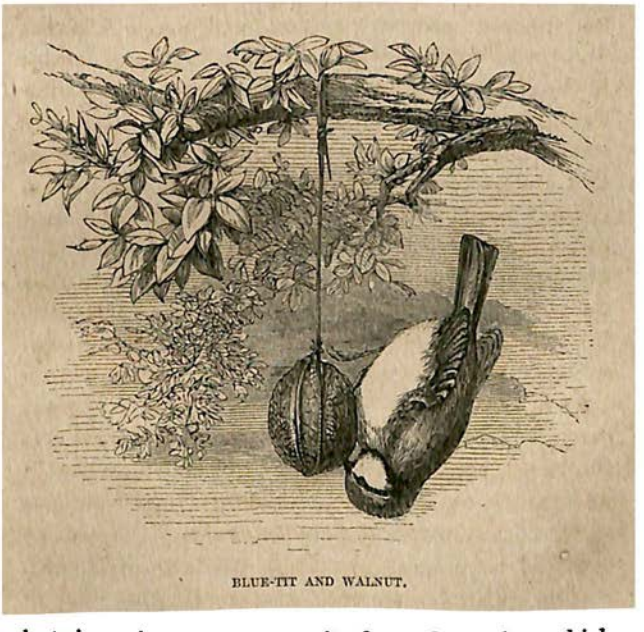
time to time, and though perseveringly driven away, always managing to carry off some trifling scrap in his mouth. Other birds who chance to be passing that way are similarly induced to reconnoitre, and in a short time there have been added to the party two or three more Chaffinches, some Sparrows, and a Tit or two. The Robins still remain pugnacious, devoting their time mainly to the pursuit of all comers — except, indeed the Tits, who, as valiant as themselves, make a show of resistance whenever they are menaced. The others when attacked merely take a short flight into the air and alight on the outskirts of the feast, and make fresh inroads as often as opportunity offers itself. But now a common enemy appears, to whom all must equally give place. The whole party suddenly fly up into the neighbouring trees with much twittering, and a cat is observed stealing along under the bushes. Puss had set her heart on living prey, but finding herself discovered makes up for her disappointment by leisurely consuming all the scraps which were intended for other mouths. The birds perched aloft on the safe but comfortless branches look enviously on, the most amicable among them picking from each other's beaks the atoms of food which adhere to the outside; the rest, disconsolate and unforgiving, sit watching the beast devour at a mouthful enough to provide each of them with a meal. This attempt to provide my feathered dependents with a breakfast having proved a failure, I had recourse to another expedient:—I procured a good lump of beef fat, perhaps a quarter of a pound, and

with a stout string tied it firmly to one of the horizontal branches of an apple-tree which stands close to my dining-room window, and watched the result from the inside.' I had scarcely taken my stand when a Redbreast appeared and set vigorously to work; but, before be could have done much more than taste my fare, a Chaffinch alighted on a twig hard by and gazed with eager look on the rich and bountiful supply. The Redbreast desisted at once and drove him angrily from the neighbourhood; but, before he had returned, another Redbreast had spied out the store and was vigorously helping himself. Thereupon ensued a tussel in the air, and, before that was concluded, five or six more Chaffinches dropped in for a meal. The scene now became most amusing—they fluttered like hawk-moths round the morsel, each, as the bone, or more correctly, the fat, of contention, was left unoccupied, darting on it, picking off a minute portion and flying off with it to a distant branch, the Redbreasts faring decidedly the worst, either because they were not now so emboldened by hunger—having enjoyed a full meal off the crumbs which had been placed for their exclusive benefit on the sill of the kitchen window—or that their selfish pugnacity gained its desired end in spoiling the enjoyment of others. The scene was soon varied by the appearance of a Great Tit, who, stationing himself on the meat, pegged away for many continuous minutes, regarding with supreme indifference, or not at all, the longing glances of the hungry party around him. The appearance of this tyrant unnerved even the Robins,

who, though busy, occasionally made a feint of attacking the arch invader, took fright at the absence of all impression made on the enemy by their sallies, and, withdrawing to a respectful distance, brooded over their discomfiture and loss of fame. The Great Tit having satisfied his hunger departed, and the squabbling began again. Now it was interrupted by a Blackbird, who, however, wary, as is his wont, looked well before he leapt upon the prey, and, considering himself far too old a bird to be caught by so palpable a deception as that, uttered a few low clucks, and with his peculiar 'catch-me-if-you-can' alarm-note, flew off to the shrubbery. In the course of a few hours the festive board was visited by a Cole-Tit and a Tom-Tit, each of whom inspired a panic nearly as deep as that caused by the Great Tit; except that they occasionally found it necessary to assert their prowess by chasing every one who ventured to intrude within a certain distance, evidently afraid of no antagonist, but suspicious of treachery. Once or twice a party of Sparrows joined the mêlée, but they never made a long stay. Hedge-sparrows were in attendance throughout, readily distinguished by the frequent twinklings of their wings. They were as modest and unpresuming as their attire. The Robins, I observed, were not so overbearing towards them as they were to the Chaffinches or even to one another, paying a tribute, perhaps, to their humility. Their modesty was conspicuous, for they rarely ventured near the meat, but contented themselves with picking up the particles which fell to the ground.

During the height of festivity a distinguished visitor dropped in, to whom all gave place. This was a Nuthatch, who perching on the meat and throwing himself as nearly as he could into a vertical attitude, with his head downwards, swayed his whole body to and fro, and dealt with his long and powerful beak a number of rapid blows at the mass, adding moreover to the impetus by expanding his wings as the blow descended. This movement resembled that of a steam hammer, and he did his work so efficaciously that he became, all unintentionally on his part, a general benefactor. Not only did he separate large pieces from the lump, with which he flew off to a distant bush, but loosened other particles, for which there arose a general scramble on the very instant of his departure. His mode of return was most singular. Instead of flying down and alighting on a twig or branch, he suddenly shot himself forward through the air as if aiming at the point nearest to the meat, and was seen sticking to a thick bough, underneath, on the side, it mattered not where, or which of his members were uppermost. He had no occasion to contest the field, for all, even Tits, acknowledged his superior merits; he only had to creep round to the upper side of the bough and his hammer was at work again with the same results. Scenes of the most amusing character and ever varying went on in this way until it began to grow dusky, when all hands retired to their several roosting places. Much of the meat still remained; but by eight

o'clock next morning all was gone except a small particle of tough skin, at which, when I looked out, a Chaffinch was holding on by the beak, fluttering with all the puny might of its wings, and endeavouring,



BLUE-TIT AND WALNUT.

but in vain, to separate it from the string which confined it.

I now varied the bill of fare for the day. I tied on some pieces of pie-crust to the tree, and suspended by a piece of twine from a twig a large piece of roast-beef gristle having a small quantity of meat

attached to it. The pie-crust was very soon torn to pieces and carried off. The gristle was a poser to Chaffinches, Robins, and Sparrows; not so to a Blue-Tit, who devoted the greater portion of two days to the task, no doubt a pleasant one, of stripping off the softer portions. The attitudes of this bird while feeding I cannot attempt to describe: provided that its beak was in contact with the beef, it seemed indifferent as to the position of its body. I remarked, however, what is, I believe, not generally known, that it is in the habit of hanging on by one foot, the other being left disengaged and projecting from the body as if paralysed. Yet its hold is perfectly firm and secure, for though the piece of meat dangled to and fro in the wind and often spun round and round, the bird showed no sign of being annoyed, but clung fast, picking and boring until all the meat had disappeared, and the gristle had dried up to the consistence of horn. A walnut suspended by a string was rifled in the same clever manner.

During the occasional absence of the Tit from his hanging banquet, a Chaffinch would sometimes invade his special territory, but without success. Its claws not being adapted to climbing or clinging, its only available instrument was its beak, and this could be used to no effectual purpose, for when struck, the gristle, being suspended freely, offered no resistance and eluded the blow.

On the third day a thaw set in, and, now that my pensioners had facilities for satisfying their hunger elsewhere, they ceased to flock to my larder as before,

and my garden was deserted by all but its customary winter visitors.

*The Bullfinch.*—Frequently, and at short intervals, there appears in the newspapers, especially those which profess to admit articles on natural history and horticulture, a series of letters on the habits of the Bullfinch. In some of these it is held up to execration as the most mischievous of all the small birds which frequent our gardens; for it picks open and destroys a vast number of the buds of fruit-trees, and is neither more nor less than an unmitigated pest. 'They're a werry instructive bird, sir, is a Bullfinch,' said a gardener to me one day; 'they won't leave a bud on the trees if you let 'em alone.' For the defence it is said: 'The Bullfinch certainly does pick open buds, but not for the sake of the young leaves or flowers which they contain. Its instinct points out to it those which contain the eggs and grubs of destructive insects, on which it feeds. It ought, therefore, to be welcomed by the gardener as an ally, rather than proscribed as an enemy.' Others admit that the Bullfinch destroys the buds of fruit-trees in spring, and thereby does much mischief, but more than compensates for the wrong by the number of insects which it devours at other seasons.

Bullfinches are numerous in my neighbourhood, and I, having availed myself of frequent opportunities of watching their habits, have no hesitation in adopting the opinion of the gardener cited above, whose facts I believe to be more accurate than his grammar.

The favourite food of the Bullfinch in early spring is the swelling buds of cherries, plums, and gooseberries. Red currants I have ceased to grow, having found it impossible to prevent young birds, principally Robins, from picking the fruit instantly that it begins to colour. Black currants are safe from all depredators. Neither Bullfinches touch the buds, nor other birds the fruit. So, as a war of extermination against Robins is out of the question, and as I disapprove of the Pestalozzian system of planting fruit-trees with the object of teaching the young the duty of self-denial, I have abolished, as I have said, the tempting red fruit from my garden. But though I admit the fact that Bullfinches do commit great havoc with the buds of fruit-trees, yet I have this to say in their defence, that they destroy blossom-buds only; leaf-buds they never touch. This statement may seem to be an aggravation of the charge rather than a palliation. In reality it is not so; for the Bullfinch, by confining his attacks to the buds which contain blossoms, destroys the hopes of the next year only. A year's fruit is lost, indeed, but the tree itself is actually benefited by the spoliation. Its leaf-buds being all left, it retains the apparatus of organs requisite for the ripening of the coming season's wood, and is not called on to expend any of its matured juices on the nourishment of blossoms and fruit, but employs the whole of the next season in making preparations for a subsequent crop of fruit. If, on the other hand, Bullfinches destroyed the leaf-buds alone, the trees would be required to ripen their complement of fruit,

being destitute all the while of the necessary organs for supplying the sap, which healthy leaves alone can elaborate. The consequence would be, that the trees would produce a crop of small-sized and flavourless fruit, and in the effort would so far exhaust themselves that they would require another year at least to recruit their strength, and that year would afford leaves alone, or accompanied, perhaps, by a sprinkling of indifferent fruit.

It is the gardener's object to secure a good crop of fruit every year. He would, if he could, dispense with the services of birds whose continued depredations would throw all the strength of his trees into foliage. He is obliged, therefore, either to kill them or frighten them away, and, for my own part, I cannot consent to call him either foolish or cruel. He cannot be considered unwise in preferring a crop of gooseberries to the doubtful contingency of having his garden kept clear of weeds and caterpillars six months hence; and as to the charge of inhumanity which is sometimes thoughtlessly brought against all slayers of small birds, it seems to me that there is no more inhumanity in killing a Finch to save one's property than in shooting a Pheasant for sport. I doubt, too, whether the very persons who inveigh bitterly against the murder of Finches would not look with complacency on the wholesale slaughter annually committed on the grubs of the Saw-fly, which attack the leaves of gooseberry trees in spring. The question is one of expediency, and I have learnt experimentally, that if I wish to have gooseberries in summer, I must, some-

how or other, protect the trees from Bullfinches in spring.

One zealous partisan of these birds, who writes in 'The Field,' is convinced that Bullfinches are beneficial rather than detrimental, as he has observed, in the course of several years, that, as surely as his trees were visited by Bullfinches in spring, so surely he had a crop of gooseberries in the following summer; but, if no Bullfinches resorted to his garden, he had no gooseberries. To what special agency of the birds he was indebted for the fruitfulness of his trees he carefully and wisely omits to give any opinion. His observation was, no doubt, correct; but, with singular want of perception, he transposes cause and effect. Gooseberries are notoriously a precarious crop. One year the trees bear abundantly, the next, perhaps they are all but totally unproductive. Now, since Bullfinches eat blossom-buds only, they do not visit the trees in those seasons when no blossom-buds are produced. On the other hand, when the trees are loaded with these buds, their quick eyes detect them, and they do their utmost to destroy the promise of the coming year. Some buds, however, escape their voracity, and these are developed and bear fruit. The argument, then, correctly stated, would be: 'There are no Bullfinches in my garden this spring, a sign that my trees are destitute of bloom-buds, and so, that I shall have no fruit.' Or: 'The Bullfinches are attacking my trees this spring, attracted by the abundant bloom-buds: I may therefore look forward to a crop of fruit which will be abundant, or

otherwise, in proportion as the larger portion of the produce falls to them in the bud, or to me in the berry.'

The best method to pursue with Bullfinches is to deter them from attacking the trees either by scarecrows, by whitewashing the stems of the bushes, or by twisting a straw-rope round each separately. A yet more effectual plan is to cover the bushes with net. The birds, thus prevented from doing mischief, but not destroyed, will remain in the neighbourhood of the garden, and more than pay for the small quantity of fruit they appropriate by their services in destroying insects and the seeds of weeds when buds and fruit are out of season.

*The Chaffinch.*—This bird begins its spring song in the first or second week of February. All the winter its call-note may be heard by anyone who chooses to listen for it, and easily distinguished, too, among the birds with which it flocks. A simple 'pink' or 'twink' is the extent of its vocal performance during the greater portion of the year. To this it adds, while it is nesting, an anxious plaintive variation of the same note, which is uttered both by the male and female when an enemy comes within dangerous proximity of their nest. The song proper is more complex, rapidly given off in a tone which, when once traced home to its author and remembered, can never be mistaken. When vocalizing, the male usually perches on the lower branches of a tree, and, without materially altering his position, repeats over and over again, for a longer period of

time than the hearer will care to listen, a short strain of about a dozen notes without variation or addition. The second performance is the counterpart of the first, and every succeeding encore is like its predecessor; so that, if a single Chaffinch were the sole songster in a garden, the ear would tire of hearing him. This, however, is rarely the case. Other birds join in the concert, and, if there be another Chaffinch in the neighbourhood, the two select the same hours of performance, and fling at each other alternate strains of defiance, as if each were intent on singing the other down. An acute ear will detect a difference of tone in the voices of the rivals, and will observe also that, although there is a general resemblance in the two strains, one may be uttered more rapidly than the other, and vary also in the arrangement of the notes. Each bird, in fact, keeps to its own tune, but the two passages are not exactly alike.

I have sometimes amused children by drawing their attention to what a Chaffinch is saying: 'I'm-come-down-this-fine-morning-to-pick-up-some-wheat-o!' In the south of Scotland the song is imagined to resemble the words 'Wee-wee-wee-wee-drunken sowie;' and in the patois of Lorraine it is translated into the following sentence: '*Fi, fi les laboureux j'vivrons ben sans eux,*' 'A shame on hard work, us can do well wi'out it.' So, in France, the song of the Chaffinch, whose gaiety has passed into a proverb, '*Gai comme Pinson,*' is interpreted to be eloquent in praise of a holiday. Mr. Bree, an acute observer of Nature, says that the Chaffinch

invariably ends his somewhat short performance with notes which seem to express the words 'Jemmy Twitcher,' by which pet name the bird is known in his family circle. I leave it for the reader to decide for himself which combination of sounds most resembles the chant of the bird, only remarking that Mr. Bree's and my own version of the last two notes, the most important of the song, contain the same radical letters, and, being the result of independent observation, are probably not far wide of the mark.

Bird-fanciers profess to discriminate minute variations in the song of these birds, and set a high value on those which are considered rare. Of these, one terminates its song with the words 'kiss me, dear,' the syllable 'de' being accented and prolonged. The other, the least common, ends its song with the syllables 'chop-way-der.'

## *April* 1*st.*

A cloudless sky, a dead calm, the weathercock pointing due east—not such a day as one would select for fly-fishing; nevertheless, having obtained permission to catch as many Trout as I could prevail on to leave a certain mill-head, in which there are not a few fine fish, I could not throw away my chance, and duly observed the 1st of April. Some three or four fish looked at my fly, and one ran a narrow risk of being hooked, for the line touched his mouth, but I returned with an empty creel. Having nothing to do, and no one to speak to, during the two or three

hours that I remained by the water's side, I debated in my own mind whether there is any foundation for the commonly-received opinion, that in rivers which are much fished Trout grow wary and acquire the power of discriminating between the natural fly and the artificial. The water in which I tried to-day had not been fished before for the season, yet I caught nothing, though I fished 'fine and far.' The reason was, that the water being still and smooth, the line as well as the flies made a splash in the water, and resembled nothing in nature which Trout are accustomed to admit into their dietary. The water, too, was clear as well as still; consequently, the fish saw a particle of feathers and silk only passing through the water, and, not believing it to be food, did not trouble themselves to snap at it. The lure did not represent itself to their imagination as a fly of any kind. Moreover, they were not hungry; they never are so when the sun is bright and the wind from the east. They did not discover then that I was endeavouring to beguile them. They saw neither point nor barb of the hook; even if they had, they would not know that the point was intended to penetrate and the barb to hold fast, and, even if they had divined all this, they could not be aware that the consequence of biting would be to be suddenly pulled out of their element to pant and die in a strange one, to be stowed away among grass in a basket, and eventually to be boiled or fried, according to their size.

Under opposite circumstances, my success would

probably have been different. Had a strong west wind been blowing on coloured water, and had the day been dull, my artificial flies would have simulated natural flies, *blown* into the water and struggling through the ripple in the effort to rise again, and this whether the mill-pond had been fished recently or not. The Trout would have risen eagerly, having learnt from experience that the habit of flies is to alight on the water and to rise again, if not first swallowed or swamped. But from what experience can fish learn the intentions of a fisherman, or the connection between him and the little tuft of feathers which floats past them?

It may, indeed, be urged, that a Trout which has often seen an artificial fly fall on the water, and risen to examine it and to turn away in disgust, may not be so readily disposed to snap at everything which falls on the water as a Trout which has seen nothing alight but real flies, and therefore snaps without examining. There is something in this; but the main reason why unfished waters are most productive is that they are then more plentifully stocked, and the more numerous the fish the better the chance of catching a dish, not simply because there are more of them, but because, when two or more fish are near one another and on the watch for flies, and an angler throws over them, they make a rush for the booty without stopping to examine whether it be a fly or aught else in creation. So it happens that the strongest and boldest are caught first, while the survivors, without having learnt anything from the calamity which has befallen their

rivals, become proportionally less venturesome as competition diminishes, and taking time to discover that what they thought was a fly is not so, they let it pass unheeded.

On more occasions than one I have seen a Trout look at an artificial fly as it passed him, follow it for the distance of a yard or more, and then return to his position. The fly has been thrown a second and a third time with the same result. The fourth time, as if he had said to himself, 'It must be a fly after all,' he has taken it and been caught. If another fish had been near him, he would probably have snapped at it the instant that it touched the water.

It is this rivalry which accounts for the common occurrence of two fish being hooked at once by an angler, who may have been whipping the water unsuccessfully for a previous hour or longer. In the eagerness to forestall his neighbour, each was beguiled by an artifice which, had they been alone, would have been examined and have failed to tempt them.

## *April 17th.*

The unusually severe character of the past winter has made itself apparent by the diminished number of non-migratory birds during the last two months. In ordinary winters and springs, Chaffinches, Yellow Hammers, Greenfinches, Thrushes, and Blackbirds are very numerous in this neighbourhood. Such has not been the case this year. We have not had a tenth part of the usual number of Finches, and the larger

birds, Thrushes and Blackbirds, have been far from common. Of the latter, many, no doubt, perished during the continued frost; consequently, there has been less melody in the woods than is usual. Robins are rarities. I have only seen one for many weeks past. During the early part of the frost they were very numerous about the house. It was a common event, when a handful of crumbs was thrown out, to see three or four of these birds at once, fighting, of course, for a share in the feast, or rather for the whole; as it is not in the nature of Robin Redbreast to be content with a share. Nearly always there was a Robin in the house, and not unfrequently two or three. I heard of some instances of their being found dead, frozen or starved; but I think it very likely that the diminution of their numbers is to be attributed to their tameness. In my own house one was caught by a servant, and being set free, dashed in terror against a closed window and killed itself. Similar cases, very probably, occurred in other houses, and it can hardly be questioned that many were killed by cats. The Redbreast being a bird which has strong local attachments performs not even partial migrations, so that none have come hither to supply the places of those killed. The solitary specimen which haunts my garden I suspect to be a male, whose partner is engaged in incubation somewhere hard by. In the course of a week or two I expect to see a young brood perching about on my standard roses, as heretofore.

Others of the common birds are now reappearing

in full force. On the common, this morning, I saw and heard Chaffinches, Yellow Hammers, and Greenfinches in abundance. These, I imagine, are my old friends of last year—who in the severe weather travelled southwards, just so far as they found it requisite for the sake of food and a milder climate, and have now come back once again to their early haunts.

There is one bird that always leaves this neighbourhood in autumn, and returns early in spring, the common Pied Wagtail. He has been back for many weeks, resuming his unmistakeable 'che-wip' when the crocus is in blossom. A pair frequent my garden every year, taking particular delight in the uppermost branches of a tall pear-tree, and in the roof of my neighbour's barn. They are my first spring visitors. Through their not being decidedly migratory, I do not regard them with the same interest which attaches to those whose life is all summer—travellers who spend their Christmas holidays between the tropics, and to whom an English summer is the cool refreshing portion of the year.

First among these returned to our common the active little Chiff-chaff. Few birds sing more continuously than he. His compass is not large, certainly, nor his strain elaborate. He has but two notes in his gamut, and those not musical intervals, 'Chip-chop, chip-chop.' He sang for the first time this year, at least in my hearing, on the 27th March. He will go on with the same note until the hot weather comes. He never devotes himself to his song like a Blackbird, who throws his whole soul into his music and

evidently expects to be listened to. Chip-chop, or Chiff-chaff, whichever you may please to call him, sings only as an accompaniment to other occupation; either he is making short voyages from the top of a leafless tree, catching gnats on the wing, or he is busily hunting for aphides among the buds. No one ever saw him sit still and enunciate 'Chip-chop, chip-chop,' as a song which he thought worthy of being encored.

On the 5th of April his congener, the Willow Warbler, began to make himself heard. The man must have a sharp eye who can, at a distance, discriminate between these two birds, so closely do they resemble each other in form and colours; but the note of the latter bird is an undeniable warble—sweet, musical, and mellow—though a strain of but few notes, terminating with a pleasant defined cadence, and repeated without variety. Two days after the Willow Warbler, the harsh cry of the Wryneck was heard on the common; an unmusical note, repeated in quick and even time, like the syllable *quee*, sounded a dozen times in rapid succession in the highest tone of a child's voice. I myself heard it for the first time on the 10th, since which I have heard it, I believe, every day.

On the 10th, I saw two Swallows hawking for flies near the river; but they have not yet begun to twitter, nor will they, I think, until they have laid the foundation of their nests.

On the 11th, a familiar sound met my ears, and one which, being unexpected, I could not at once

refer to its proper origin. It had the semblance of a winter sound, and was associated with snow and holly-berries. There could be no mistake about it. A flock of Fieldfares, resting themselves on a tall elm, had discovered my approach, and were interchanging their unmelodious note of alarm. I have rarely seen them so late in the season as this. Perhaps the severity of the winter drove them very far to the south, and they are now returning to their summer haunts in Scandinavia.

On the 15th, a Cuckoo was seen to fly across from the common to a neighbouring orchard. Can this be the one that was nursed by the Flycatchers,* and has he enough good feeling to run back and see the cradle which, whatever he may now think of it, was once big enough to hold him? It was repaired by his fond foster-parents after he was breeched, and has stood frost, snow, and rain unscathed.

The warm weather, which has brought back so many of the migratory birds, has restored many of the missing Finches. I could not stand still under the firs on the common to-day, for a minute, without hearing Chaffinches, Greenfinches, Tits, Wrens, Chiffchaffs, and Willow Warblers, all singing together—not in concert, for some seemed to be uttering notes of defiance to birds of their own feather, and others to be twittering in joyous indifference to any other existence than their own. But, if there was no harmony, there was certainly no discord; and how this should come to pass, I am not sufficiently

* See *infra*, p. 67.

acquainted with acoustics to understand, much less to explain.

I have been scribbling on till it is not far from midnight; but I cannot put down my pen without making yet one more note. Yesterday, April 16th, is the day on which the Nightingale is generally heard for the first time in this part of Herts. I recollected just now that I had omitted to listen for it; so, to remedy my error as far as possible, I laid down my pen, and softly unbarred the front-door, for all the household but myself were asleep. A charming calm night, a bright moon, clear starlight, no sound but the distant rumbling of a railway train: it dies away: out of its ruins rises a faint shrill piping, indicating pain rather than rejoicing; and before that is well ended, out bursts the liquid gurgling note that no instrument but the throat of the Nightingale can produce. The Nightingale is arrived, and, happy augury, I have heard his song before that of the Cuckoo.

*April 5th*, 1862.

Having been told that the cook had found a number of shells in some trout which I brought home on the 1st inst., I gave directions that all solid matter found in some fish of the same kind, which I caught to-day, should be brought to me. I have the result before me on a plate. Of eight fish which I brought home, two were under, the remainder were over, half a pound in weight. In the latter were found 148 shells, averaging three-eighths of an inch

in length. Some appeared to have been recently swallowed, others were partially digested, and a few were empty. Either the fish had swallowed them in that condition, or, what is more probable, they had been swallowed alive, and the contents had been digested. The majority were various sized specimens of *Limnæus pereger*; with them were mixed a few of *Succinea putris*, one *Planorbis marginatus*, one *Limnæus stagnalis*, above half an inch in length, and one bivalve, *Cyclas*. All the above are fresh-water molluscs. I detected also one small land-shell, *Helix hispida*, and a small lump of resin. The last-mentioned substance seems strangely out of place in the stomach of a trout; but how it got there is clear enough. Resin is largely used in the manufacture of paper, and it was in the still water just above a paper-mill that I had been fishing. A piece must have fallen in, and been swallowed by the trout; but in what its attractiveness consisted, I can offer no opinion.

Shell-fish, as an important item in the food of trout, seem not to have received the attention they deserve. It is far from improbable, however, that the condition and rate of growth of these fish may be seriously affected by the abundance or scarcity of this kind of food, especially during winter. There is no doubt, I believe, that the snail-like aquatic mollusks descend into the mud at the approach of winter, and hybernate there. In spring they emerge from their retreat, and live on the herbage growing in or near the water. Thus during one period of the year they

are available as food for fishes, and this is the season when flies and beetles are not to be had. But as warm weather comes on, the mollusks leave their hiding-places, and crawl out of the reach of fish. The latter then, perhaps, lose their relish for shell-fish and change their diet for winged insects, which begin to appear simultaneously with the withdrawal of mollusks from the water.

The number of 148 shells among 6 fish, allows on an average 25 to each—a sufficient number, I submit, both of fish and shells, to warrant the assertion that mollusks during their hybernation form a large proportion of the food of trout.

It might, then, be worth the while of persons who preserve these fish in artificial reservoirs, to take measures for the introduction of fresh-water snails, and to plant at the same time the weeds on which they feed. They might be collected from the margin of rivers and ponds during summer, and transferred to the banks of the trout streams, where they would multiply rapidly, and materially help to bring the fish into season early in the following year.

It might also be worth while to try an experiment with small land-snails. Many of our downs are thickly covered in summer with *Helix caperata*, *H. virgata*, *H. ericetorum*, and *Bulimus acutus*. A basketful of these might be collected with great ease. They might be thrown into still water some evening, and the spot fished with a fly on the following day. Possibly they might attract trout, and secure the fisherman an hour's good sport. He should carefully

examine whatever fish he caught, and if he found his bait successful, he might, by repeating the manœuvre, lay a sure foundation for many a day's good fishing. At all events, he would learn whether trout eat snails in summer as well as winter.

*April 28th.*

A Willow Warbler found his way into my greenhouse yesterday, and as he did not seem disposed to fly out before closing time, I was obliged to shut him in. This morning, when I went into the house, I found that he had made himself quite at home, and was paying for his lodging with his services. So busily was he occupied in hunting for aphides, that he took absolutely no notice of me nor of three or four of the children. He hopped about from pot to pot, often picking up particles from the soil, but more frequently climbing about the cinerarias, geraniums, roses, and other plants, of which not even the slightest seemed to bend under his weight. Several times he made the circuit of the house, often passing within two or three feet of me, and not appearing in the least alarmed when I bent down till my face was within twelve inches of him. Now and then he would fly up and perch on the iron framework of the roof, or flutter against the glass, as if he felt disposed to extend his flight; but nothing dispirited at finding himself a captive, he flew down and instituted another hunt among the plants. It is not unusual for birds of this kind to show themselves fearless of the human species. They will hunt about in the hedges within

a few yards of the spectator at any time, occasionally uttering their short but sweet warble; but I never saw wild birds of any kind so fearless as this. In the course of one of its flights round the house it perched on one of the boys' heads—for an instant, certainly; but almost any other bird would, on our entering the greenhouse, have dashed against the glass, and in all probability killed itself. This fearlessness of man would lead me to suppose that the Willow Warbler must spend its winter in some country uninhabited by human beings, and being little molested in this country, it has neither hereditary nor acquired fear of man. We read of birds in newly-explored countries being as indifferent to the appearance of man as Wagtails are of oxen. This is because no instinctive dread of the lords of the creation has ever been excited by overt acts. A man, I suppose, presents to them no appearance which especially distinguishes him from a sheep or deer: the birds have received no harm from him, and they fear none. Some birds, however, which come to our shores from utterly desolate regions, bring with them so strong an instinctive dread of man, that they most scrupulously shun his neighbourhood. A flock of Wild Geese, for instance, when they visit our marshes in winter, keep the strictest possible watch. Invariably one of the party stands sentinel while the rest are feeding, and in one way only is it possible to get near them, namely, by the help of a stalking-horse, real or fictitious. Let a man drive a horse before him, keeping himself well concealed, and he may chance to get a shot at them; or if he carry

before him a tolerably well-executed screen in the shape of a horse, he may perhaps succeed. But Wild Geese are fair game everywhere, and have been so for countless generations. Unlike the tiny Willow Wren, who has no human enemies but schoolboys,—who hunt out his snug and well-concealed nest, or 'wood-oven,' as they call it,—the Wild Goose has been hunted by man ever since man was a hunter; and it is not unreasonable to suppose that as the instinctive faculty of 'setting' or 'pointing' is hereditary in certain races of dogs whose progenitors have been taught to set and point, so the fear of man has become hereditary in certain birds which have for generations been made by man the object of pursuit.

*May 1st.*

*Gulls and Jackdaws.*—The tendency of Jackdaws to build their nests in the society of other birds is, I think, nowhere more conspicuous than on the rocky sea-coast. The rambling cliffsman, who has toiled up and down many a thymy promontory, and seen nothing of animal life but an occasional Diver who looks around him from the ridge of a ground-swell and instantly disappears, or a row of Cormorants on a rock, economising their time by drying their wings for a new surfeit while the last is undergoing the process of digestion, reaches at last a sudden re-entering angle in the cliff, which for ages has borne a local name indicating that it is periodically frequented by birds. If he be a stranger, and not

familiar with such localities, let him draw near with caution. The short turf of Sheep's Fescue-grass, Thrift, and Buckshorn Plantain extends evenly to the verge of a precipice, which descends some two or three hundred feet sheer into a boiling surge. The footing, indeed, is firm; but if he plants his foot near enough to the edge for his body to be bent over, there will creep through his marrow a longing horror to know what would become of him were he to make just one little step in advance—and that step, strange to say, he will feel inclined to attempt. So, if his brain be none of the steadiest, he will act prudently to lie down some feet from the margin, and crawl forwards in ignominious security till his head hangs over the steep, and then gently to drop a stone. The effort of flinging might be dangerous: he might lose his balance, and the sender might accompany his missile; it would be useless too, for had he the strength of Hercules he could not fling it far enough to be visible when it touches the water. But mark the result! The stone descends noiselessly to him, but its sharp clink against a ledge of the façade reaches the quick-eared birds through the deep bass of the roaring surge beneath; it is unusual, and denotes aggression. No time for second thoughts. From every ledge and every fissure to be found over a hundred yards on either side forth sally in hosts the nursing mothers of the colony. The white wings of Gulls beat madly outwards; 'Kee-ock, kee-ock, kee-ock,' is their war cry, though the owners of the white feathers have no heart to do

battle for their hearths and homes. On their trusty allies, the Jackdaws, it rests to charge the invader, and a magnificent show of resistance do they make. Flying outward but to a short distance, they collect into a phalanx which would strike terror into the heart of a Kestrel, or even a Peregrin Falcon; but, the enemy being neither of these, though not daunted, they are perplexed—they cannot dislodge the intruder, yet they can distract his attention. Keep firm footing, thou barrier of sea-birds, and no harm will ensue. These tactics are all feints. This whizzing of wings above your head ends in itself; this angry clatter, which comes in waves of discord, is no prelude to an encounter with beaks and claws. It is, after all, 'nothing' but a sham fight. Keep still, and even the most demonstrative will cease their idle clamour and return to their nurseries. Move onwards, and you will be escorted by a guard of honour round the next promontory, whence they will return to their several nests, and you will be left to your solitude, to be relieved again only by a stray Diver or two busily at work in the shallow water of yonder cove, and another band of surfeited Cormorants hanging themselves out to dry, too far out of your reach to notice you, or to care for you if they did.

If the reader should ask whether the position held by the Jackdaws relatively to the Gulls is that of unpaid volunteers or mercenaries, I can scarcely answer him satisfactorily. It is said that when they associate with the lawful occupants of dove-cots, both

eggs and young pigeons are wont to disappear unaccountably; and if this be true, it is possible that they may extend their protection to Gulls with a view to occasional banquetings on the young birds while the old ones are far away in pursuit of fish.

### *The Wryneck.*

A friend once sent me a message, enquiring what was the name of the bird which he frequently heard in his park during the spring and early summer, breaking out all on a sudden with the cry 'Thieve, thieve, thieve, thieve,' rapidly repeated. I was compelled to confess my ignorance.

A Bullfinch, a Starling, a Jay, either of these might, if it would, in a sudden fit of honesty, thus proclaim its ordinary vocation; but neither of these birds ever utters a note capable of being twisted by even the most ingenious ear to resemble the word 'thieve.' The question was asked me about the close of summer: I listened on through autumn and winter, never forgetting the enigma proposed to me whenever any bird uttered its note, but all in vain. Spring came: it was time for the Cuckoo and Nightingale to let their voices be heard in the land. It is one of the most pleasing of spring amusements to discriminate the notes of the various migratory birds as soon as they arrive. I was walking in my garden one morning in April, listening to catch the greeting notes of any of these new comers, when from a tall apple-tree within a few yards of me there rang out, without prelude or premonitory warning of any kind, a harsh, loud, rapidly repeated cry, in

which I instantly recognised the 'thieve, thieve' of my enquiring friend. It was the well-known note of the Wryneck. The syllables, 'quee, quee, quee, quee,' approach nearer to the enunciation of the bird than the other; but it is pleasant to translate the notes of birds into articulate sounds having a definite meaning—witness the promptness with which children detect set phrases in the song of the Thrush or Chaffinch; so I easily admitted the propriety of my friend's interpretation of the Wryneck's note, and my conjecture proved to be right. Shortly afterwards I happened to be fishing in a river in Somersetshire, and heard the same cry at intervals all the morning. Once, as I drew near a bridge, it seemed so close to me that I fancied a bird must be perched on the bridge, a most unusual position. Determined to discover whether this were so, I went on the bridge and found there two countrymen, one of whom had invented an ornithological pastime worth recording. By placing a piece, about an inch long, of a tender blade of wheat on his lower lip, and then forcibly and rapidly emitting a succession of puffs, he produced a sound so closely resembling the note of the Wryneck, that not only had I been deceived, but he had inveigled to his neighbourhood several of the birds themselves. He knew the name of the bird, and as he entertained no sinister design, but simply mocked its language to make it answer from a neighbouring tree, I thought he might have spent his dinner-hour less innocently. At any rate, I became his disciple, and before long I could imitate the Wryneck as well as my preceptor.

## *May 2nd.*

Strolling under the fir-trees on the common, I observed a bird clinging to a fir-cone, and busily employed in picking out the seeds. I thought at once of a Crossbill; but my bird was too small for that, and presently I saw distinctly that it was a Goldfinch, accompanied, too, by another, which was similarly occupied. They were very quietly at work, and clung to the cones in precisely the same attitudes that Siskins and Redpoles assume when feeding on alder-cones. To any one acquainted with their habits, their presence might have been betrayed by the light wings of the seeds, which floated away through the air to some distance—not spinning in their descent, as whole seeds fall, but oscillating like so many scraps of thin paper. The sun was shining brightly, and the cones were cracking from the action of the heat. Possibly the knowing birds may have discovered this fact, and visited the trees at the season when the cones of the Scotch fir split and discharge their seed. The Crossbill, with the marvellously perfect machinery of his bill, can open the strongest cone, whatever may be its condition; but it is probable that the Goldfinch, with his inferior apparatus, can only get at the seeds when the cones have a tendency to crack. I recollect seeing a pair of Goldfinches in a Scotch fir at the same season last year. No doubt they were similarly occupied.

## *May 5th.*

*A Novel Race.*—I was travelling on a part of the Great Western Railway which for some distance ran close to and parallel with a narrow stream. A Kingfisher had been disturbed by the approach of the train, and made all haste to get out of the way. Any other bird so circumstanced would either have turned back or have flown away from the line of rail. But this bird flies too swiftly to think it possible to be overtaken, so it made right ahead, hoping, no doubt, to distance its pursuer: it has besides a great antipathy to flying over land, if water be within reach; it therefore habitually follows the course of a river, let it wind howsoever much. On this occasion, not even the terror of the puffing monster gaining ground on it was powerful enough to make it deviate from its habit; so the bird and the train pursued their course side by side, and at a pace so nearly equal, that for several seconds it was opposite the window of my carriage, seemingly plying its lovely wings all in vain, but in reality shooting along its line of river as steadily as its competitor the engine was tearing along its line of rail. The river and railway soon diverged, and we parted company with the bird. It is not often that the monotony of a railway journey is so pleasantly relieved.

*May 6th.*

I observed to-day on the common a small party of Wheatears; there were four of them, perched on the ground or on the low furze bushes, but not hovering, as I have seen them, near the sea, immediately after their arrival; nor did I hear their note. On the two following days I searched for them again, but they had disappeared; though Whin-chats and Stone-chats were numerous. They had perhaps alighted from a flight in the hope of finding a convenient place for rearing a family, but being disappointed in finding a supply of necessary food, had passed on to some more eligible spot. That they do occasionally breed on the common I know, having observed young birds there in August. The wind had been easterly for several weeks previously, and the ground was parched. On the same day I observed, for the first time this year, Swifts, Martens, and Whin-chats. The same wind probably brought all four. Stonechats, Greater and Lesser Whitethroats, Blackcaps, and Nightingales, were also more abundant than they had previously been.

*May 7th.*

I watched for several minutes a Willow Warbler earnestly searching a sprig of furze; so intent was it that it allowed me to approach within a few feet—near enough, in fact, to detect the yellow streak above the eye. I drove it away, and found on

examination that the sprig was infested with small black aphides, on which, but for my unwelcome interference, it doubtless intended to make a hearty meal. This bird habitually makes short flights into the air, in pursuit of winged insects which it has descried from its perch, and immediately returns to the same or an adjoining branch. It utters its short but sweet warble, both while perched and while flying.

*May 8th.*

I watched for some time this evening a Great Tit, busily occupied in a cherry-tree. He seemed to be searching intently for insects among the tufts of flowers, but his movements were accompanied by an incessant dropping of blossoms, all nipped off close to the calyx. I examined a large number of these, and found that in every case the flower was nipped off either across the tube of the calyx, just below the sepals, or that it contained a hole large enough to admit the beak of a bird, and too large to have been the work of an insect perforating for honey. Query,—does the Tit enlarge a hole in quest of an insect lodged there, or is it the prime originator of the mischief, plucking the blossom for the sake of the honey contained in the calyx-tube? I am inclined to the latter opinion; and if this be the true solution, I can account for the attachment displayed by Chaffinches to my polyanthuses, scores of which lie scattered on my flower-beds, nipped off just below the expanded petals.

The ovary of the cherry blossom I found in every instance uninjured.

*Anecdote of the Great Tit.* — 'A gentleman of Angers, in France, walking one morning in his garden, observed on the top of a tree a Great Tit, which, as he approached, instead of avoiding him, hopped down twig by twig until it came within reach of his hand. He quietly took hold of it, and was not long in discovering the cause of this strange behaviour, for the poor suppliant had sticking in the top of its head an enormous tick, which completely disfigured it. The supposition is, that the poor creature suffered great pain from its tormentor, and was directed by instinct to confide itself to the intelligence and superior power of a man with whose person it was familiar and who had never harmed it. The gentleman having rid it of its persecutor opened his hand, and it flew away.' This story, if it be true (and if not, there are many other authentic ones equally strange), leads one to the belief that the inferior animals, besides possessing an instinct which compels every individual to act, under certain circumstances, as the rest of its tribe do, are endowed with a higher intelligence, involving some amount of deliberation and planning, associated with a clearer view of their own position in the scale of beings, than we give them credit for.

*The Lapwing.*—Whether birds congregate for the sake of the pleasure they take in each other's society, or for mutual protection, it is not easy to say. If Lapwings associate for the latter reason, they commit

a fatal error. Their eggs are considered a great delicacy by epicures, and fetch a high price. If the nests were scattered far and wide on the face of the country, it would be scarcely worth anyone's while to hunt for them; but as there is a fair chance of finding a good many within a limited space, when once the favourite haunt is discovered, the occupation of egg-hunting is regarded as a kind of harvest: dogs are trained to discover the nests, and the persons who collect them learn by experience to interpret the actions of the parent birds, and are guided to the nests by the very means intended by the old birds to lead astray. The hen bird, for example, never takes wing directly from the nest, but first runs along the ground, while the male flies round the head of the intruder, or simulates lameness—always proceeding in a direction away from the object of his anxiety. Many thousands of eggs are thus annually collected, and afford a considerable revenue. They are sold in London for sixpence each—an enormous price, when their small size is taken into account and the fact that they are, after all, little if at all superior to an honest barn-door hen's egg.

*June 15th*, 1860.

This morning a boy brought to the house a young Cuckoo, which he had just found in a Hedge Sparrow's nest. It was about half-fledged, and very ugly, but had an intelligent look about it which excited my sympathy. I thought at first of telling the boy to

take it back to the place where he had found it, nothing doubting that its foster-parents would resume their office of feeding it, even though their nest was destroyed; but bethinking me that a boy who, for the chance of getting twopence (the price at which he valued it), would take a nest containing a young bird, was scarcely a trustworthy agent on an errand of mercy, I paid the young robber his ransom-money, and became proprietor of the bird. A happy thought had struck me: there were several nests containing eggs in the immediate neighbourhood of the house: I would try what would be the result of taking the eggs out of one of these and substituting the young Cuckoo. Judging from all that I had heard and read on the subject that the new foster-parents would be proud of their charge, I selected for the purpose the nest of a Flycatcher, who had built in a standard rose-tree, about a dozen yards in front of the dining-room windows, and had been sitting for a week on four eggs. In less than two minutes the exchange was made, for no time was to be lost. The young bird was hungry, as it showed by opening its ugly orange-coloured mouth, and uttering, whenever any-one approached it, a sharp impatient chirp, almost as shrill as that of a mouse. The young bird did not approve of the transfer, clinging with its strong claws to the remains of the nest in which it was carried. The Flycatcher's nest seemed hardly big enough to hold it, but having first removed her eggs, I dropped it gently in, and withdrew out of sight. In about five minutes I returned to within a short distance,

and was much pleased to see the Flycatcher quit the nest with her ordinary flight, as if nothing unusual had occurred. I went into the house, sat down in the dining-room, threw up the window, and watched with an opera-glass. There was the foster-mother, already engaged in her motherly vocation, delighted, no doubt, to believe that in her brief absence her four eggs had turned into such a beautiful great bird. The Cuckoo's mouth was wide open, and she was putting fly after fly into his jaws, her own head disappearing every time. For about a quarter of an hour she brought him a fresh morsel at intervals of from half a minute to a minute, and at the expiration of that time, considering perhaps that he must be satisfied and needed to be cuddled after his meal, she spread her wings and placed herself over him. But this did not suit the young glutton; he pushed his head out from under her wing and repeated his sharp cry, and in less than a minute the Flycatcher was feeding him again. Just then a 'tchick, tchick' from the rose-tree, answered from an apple-tree hard by, announced the arrival of the male bird, and forthwith both birds united in the work of feeding— the male sometimes passing his booty to his mate, if she happened to be in the nest, and sometimes feeding the Cuckoo himself. More than once I observed one of the old birds alight on the ground and pick up something; whether guided by instinct to procure a worm or grub as more appropriate food for their charge, or merely descending to capture a fly at rest, I could not discover. This continued for several

hours, the female bird sometimes sitting on the nest for a short time at intervals, but being more frequently employed in hawking for flies and bringing them home. I did not actually go close to the nest until three hours had elapsed, and even then I only looked in, lest any interference should mar the experiment. The young Cuckoo was squatting most comfortably in the hollow of the nest, which he more than filled. As I passed he looked round at me and opened his mouth, uttering his shrill note at the same time; and the old birds, who were in the neighbourhood, took no more notice of me than they did on ordinary occasions.

*June 23rd.*

The Flycatchers have been unremitting in their attention to their foster-child, and he does great credit to their bringing up. For the first few days his shrill note might be heard at any time of the day, but latterly he has become silent. At first, when anyone came near he opened his mouth as if craving for food, and seemed to feel no alarm; but during the last two or three days he has learnt to consider human beings as his natural enemies. When anyone comes too near he half rises, ruffles his feathers, and opens his mouth in a menacing attitude, which, to those who know how powerless he is to hurt, is most ludicrous; though to intruders such as are likely to molest him in wilder situations, it may make him appear formidable. He does not want courage; this I tested to-day by bringing near to the edge of the

nest a stuffed Starling. He became much excited, and twice snapped at the Starling's beak as if prepared to do battle; upon which I removed the object of his alarm or anger, whichever it might have been. He is now covered with feathers above; but when he throws himself into his attitude of defiance, we can discover that he is nearly bare below. He more than fills his nest, and it is marvellous how so small a bird as a Flycatcher can manage to shelter him. We had a terrible thunder-storm the other evening, attended with torrents of rain, and were somewhat afraid that he would suffer from the effects; but we found in the morning that he was in no way the worse. I seated myself in a chair about ten yards from the nest one evening, in order to watch the process of feeding. For ten minutes or more the parent birds kept flying about from tree to tree, chirping uneasily, evidently troubled at my presence. Several times they made a dart towards the nest, as if intending to alight, but turned back. At last the hen bird summoned up courage, settled on the nest, and spread her wings over the Cuckoo. It has been observed more than once that the old bird does not always give him the produce of a chase in a single portion, but in several morsels, thrusting her beak down his throat each time, and raising her head between the transmissions of food as if disgorging something; hence I conclude that when more flies than one are caught they are not retained in the bill, but stored away for safety in the cavity of the cheek.

*June 25th.*

The plumage of the young Cuckoo has grown so rapidly during the last two or three days, and he has himself so much increased in size, that his dwelling seemed this morning too small to hold him in comfort. I therefore cut away some of the twigs which surrounded his nest, in order to give him room to expand. He resented my intrusion with great audacity, pecking at my scissors and fingers lustily. Even then I did not feel altogether satisfied; he might, I thought, take alarm at my appearance, and as his feathers became stronger attempt to fly—in which case he would perhaps tumble to the ground and be hurt, or, if he succeeded in getting away, might become the prey of a cat or other vermin. I accordingly determined to make him secure until he should be able to shift for himself. I suspended in the apple-tree which is the favourite resort of his foster-parents a large square wicker cage. In the corner I placed a Thrush's nest, taken from a hedge hard by, in which a brood had been reared, and nearly filled it with cotton wool. A young friend, who took great interest in his fate, then carefully removed him from the Flycatcher's nest and deposited him in his new cradle. He protested strenuously against the change, pecking at my friend's fingers, and clinging with all his might to the Flycatcher's nest, like a refractory child undergoing the process of being carried off to the nursery. He was soon settled, however, and the door fastened, when I retired to watch the result from the house. He

shuffled about a little, but evidently approved of the change now that it was effected: he stood up, stretched himself, preened his feathers, and settled down comfortably on the cotton wool. Meanwhile the Fly-catchers were sorely perplexed. They perched in the tree, each having in its beak a supply of food, fluttered anxiously from bough to bough, looked at the cage, and, I imagined, discovered their big baby; but before they went near the cage, they each in turn visited the old nest in the rose-tree. One of them stayed in the nest for some seconds, and then fluttered about it as if searching for the lost treasure. I began to be anxious, fearing that having found their nest deserted they would take their departure, and my nursling would have to be reared by hand. This, however, did not take place; they flew back to the tree, uttered their 'weet, chip, chip' in the usual tone, but more frequently than they generally did, seemingly more perplexed and frightened than grieved. Occasionally, as if impelled by instinct, they made short flights in pursuit of insects, or alighted on the ground—invariably, however, returning to the tree without making a long flight, and perching gradually nearer and nearer to the cage. Once or twice one of them would fly in a direct line for the cage, but suddenly arrest its flight, as if not altogether assured that no treachery was intended. At last one of them perched on a twig within a few inches of the Cuckoo, who shook his feathers, opened wide his orange-coloured mouth, and evidently expected that a morsel was forthcoming. The old bird, however, had not

even yet thoroughly determined to brave all risks, but having hovered for a few seconds close to the corner of the cage in which the Cuckoo was seated, again perched in the tree. Half an hour was thus consumed; at the expiration of that time, the female bird clung to the cage, thrust her head between the bars into the Cuckoo's open mouth; and I congratulated myself on the success of my experiment. Both old birds now brought food and administered it; but I remarked several times that the male flew to his mate as she stood on a twig, and passed something from his beak to hers. I did not count the number of times the Cuckoo was fed, but at the expiration of an hour from the time of the exchange being made, the female bird had found her way between the bars of the cage, and was able to feed him with comfort. Her method was to stand on his back and thrust the food down his throat. After this, both birds made frequent visits to the cage, sometimes feeding him through the bars, and sometimes entering the cage; and in the course of the evening I saw one of the old birds alight on the perch which passed across the cage, and having rested there a short time, fly out with perfect composure. It was about five o'clock in the evening when this novel 'flitting' was carried out. I should much like to see whether the old birds have established themselves in the cage for the night, but I am afraid of disturbing them until they are thoroughly settled.

*June 26th.*

A little girl coming to the house on an errand brought in a half-fledged bird, apparently a Whitethroat, which she had picked up on the road. The little creature's cries for food were incessant, so in pity of its famishing state I placed it in the Flycatchers' nest as a desperate experiment, and withdrew. It was hardly fair, perhaps, on these poor birds, already overtaxed by the cravings of the young Cuckoo, to require anything more of them; they, however, did not think so. They discovered it immediately, and were observed to visit the nest twice in the course of a few minutes; but the new comer was not pleased with his lodgings, and had very soon disappeared. It is probably somewhere in the garden, dependent on the charity of the Flycatchers, who, I imagine, having once taken it under their protection, will scarcely suffer it to perish.

*June 27th.*

The young Cuckoo was missed from his nest this morning, but speedily discovered, perched on the bar which traverses his cage. His appearance improves daily, and his diet evidently agrees with him, or he would not have the strength to leap on his perch. He remains there all day, and his foster-parents pay him frequent visits, either passing him his food through the bars, or entering the cage and taking their stand by his side on the perch. He still utters

his shrill cry when expecting food, but not so frequently as at first. He is left alone at night, the old birds roosting in the trees hard by. The latter fact is proved by their uttering their note of anxiety whenever I approach the cage after nightfall. The young bird moves his body up and down, and makes ludicrous grimaces at anyone who approaches his cage. The weather continues excessively wet, but his cage is protected by a waterproof canopy, so that the rain does not touch him. 'How pleasant it must be,' said one of the young folks to-day, 'for him to be standing on a dry perch, and to be fed.'

*June 28th.*

More young birds. Mr. ——'s gamekeeper brought me five young Sparrow Hawks, which he had just taken from a nest. They are mild amiable little creatures, with soft grey eyes, and puffed out with copious white down. The young people have taken charge of them, and have fed them several times with worms and raw meat. As they take eagerly what is offered to them, we hope to rear them.

*July 1st.*

The young Cuckoo daily grows more voracious. He is becoming handsome: his tail and wing feathers are now conspicuous with bars of black, brown, and white, and all his under parts are marked with transverse bars, after the manner of a hawk. His note, however, utterly unlike the harsh wild cry of predacious birds (which the young Sparrow Hawks

uttered to-day for the first time), is weak and shrill, and might proceed from a bird as small as a Sparrow. Another instance this of the marvellous way in which all the minor details of his history fit into one another, and together produce the desired result—the bringing up of a large and powerful bird by weak and small foster-parents. He is, in very truth, a singular bird, but altogether unlovely. The thankless overbearing attitude he assumes towards his reputed parents is enough to provoke one's anger, I was going to say disgust. His cry for more food is now all but continuous, and the Flycatchers are untiring in providing for his wants. Now that he has taken his stand on the bar which goes across his cage, he appears to be always on the look-out for the arrival of one or other of them. My own occupations prevent me from watching him for a long period together, but whenever I do go near the cage I am sure to see one of them either coming or departing, and sometimes both in the cage together. The old bird, with a mouth full of flies, just alights on the apple-tree, and is instantly espied by the Cuckoo, whose cries become more frequent and rapid. The Flycatcher then enters the cage, perches sometimes before, but more frequently behind, the Cuckoo, and thrusts its head into his voracious maw. The chirping of the young bird still continues, and if his feeder ventures to stay in the cage for a second, as it sometimes does, casting a look of admiration on the fascinating young glutton, the Cuckoo stretches out towards it his open mouth, and then deals it a

sharp peck, evidently as a hint to be off for more. This I have witnessed a great many times.

Under ordinary circumstances, the Flycatcher retires to rest early. Yesterday evening, however, the Cuckoo continued to utter its cry of hunger until after nine o'clock, and the birds fed it until that time. One of them was observed carrying in a moth or beetle, certainly some insect larger than a fly. This evening it was quiet at eight o'clock, and the birds, wearied perhaps, as well they might be, with their long day's toil, had gone to roost. At half-past eight I went to the cage to see if the Cuckoo was asleep. If he was, my approach disturbed him, and reminded him of the empty condition of his stomach. He gaped at me angrily, and no sooner had I withdrawn than he recommenced vociferating for food. His caterers were within call, and not only answered him with a chirp, but paid him several visits with food. I could not help thinking that if his cry had resembled that of the hawk when clamorous for food, they would have been afraid to come near him. As it is, I shall hardly be surprised if the termination of his connection with the Flycatchers verifies the statement of Pliny, that when able to cater for himself his first meal is made on the body of his foster-mother. The contrast between the size of the two birds is great already. When he is full-grown, the operation of swallowing her whole will certainly be practicable. His tongue and palate are thickly set with sharp prickles pointing inwards, to assist, I suppose, the swallowing of living insects. The

Flycatchers appear to thrust their beaks below these in his throat when they deliver him a fly, so that he has only to choose his opportunity, and he can easily throttle his feeders in succession, and devour them at his leisure. I gave him a living caterpillar to-day on the end of a stick: he snapped at it instantly in anger, and held it in his beak; but discovering that it was eatable, he gave his beak a sudden jerk, and swallowed it in a twinkling.

*July 14th.*

For many days past the young Cuckoo has been growing more and more voracious and clamorous for food. The first sound that I have heard in the morning has been its harsh cry, repeated more frequently and continuously than ever. Its note is decidedly unpleasant, and as unlike the cry 'Cuckoo' as can be well conceived. It can be imitated by drawing in the breath forcibly between the closed lips; but the closest resemblance that it bears is to the noise made by drawing a tightly fitting glass stopper from a bottle. It ceased at intervals, when neither of its foster-parents was in sight, but was renewed with redoubled vigour when they appeared. Not even when swallowing the proffered morsel did he stop his clamour, but accompanied it by a sharp peck at the feeder, which was repeated if the latter ventured to remain a moment in the cage. Wishing to relieve the poor birds of a portion of their labour, I offered him worms, raw meat, and chopped egg; but either he misunderstood the honesty of my intentions

or did not admire the food. His plumage has grown rapidly of late, so that he can move freely about the cage, and he may now be pronounced full-fledged. Since this has been the case he has ceased to show anger when any intruder has come near his cage, but has appeared terrified, fluttered against the wicker bars, and struggled to force himself between them. We all agreed yesterday that a cessation of his clamour would be a relief; so this morning, at eight o'clock, I opened the door of his cage, expecting that he would be off at once; but the purport of opening a door was not within the scope of his instinct. He remained till eleven without discovering that liberty was at his command. About this time, a few seconds after receiving his food, he hopped down on the floor of his cage, suddenly discovered that in one direction there was no obstacle to his departure, stood on the threshold, flapped his wings a few times, and committed himself to the air. He first flew in the direction of the house, but speedily wheeled round, and took a long flight across the meadow in the direction of a grove on the common. All this took place in the absence of the Flycatchers, both of whom returned in the course of a few minutes and flew, one into the cage, the other to a branch of the apple-tree close by. Their feelings, I can imagine, may have been something like those which shipwrights might experience, who, having left a vessel on the stocks ready to be launched, should return and find that their creation had taken itself off without permission or persuasion. They did not, however, seem much

distressed, but perched in the apple-tree apart from each other, uttered no note, preened their feathers, a portion of their toilette for which they could not have had much time of late, made occasional flights in pursuit of insects, and for more than two hours continued to return at intervals to the cage, perhaps from habit, and perhaps to assure themselves that their charge had no further need of their services.

That their labours have been far more extended in duration than is usual with those birds is clear from the following fact, which is of itself one of unusual occurrence:—In another part of the garden behind a loose plank in the wall of a barn a pair of Flycatchers built their nest a short time after the Cuckoo-feeders. They hatched their eggs and reared their brood in safety. The young birds were fully fledged and left their nest a week ago, but continued dependent on their parents for several days. I yesterday descried a bird fly from their nest, and, being curious to know what it could be doing there, I placed my hand in the nest, which to my surprise contained three eggs, no doubt the foundation of a second brood. This is the first instance which has fallen within my observation of a Flycatcher rearing a second brood in the same nest, and what makes its attachment to the same spot yet more remarkable is, that the nest is built in a place close to which some one or other passes at least twenty times a day, and that the hen-bird never became so familiar as to remain at its post when anyone drew nigh, but stole off to a neighbouring pear-tree until the apprehended

danger was past. The same custom is continued with the second brood.

*July* 16*th.*

I was somewhat troubled this morning by the appearance of a man at the garden gate offering for sale a young Cuckoo which he had shot in the neighbourhood. I doubted not that my protégé had met with the ordinary fate of pets, and accordingly purchased the bird that I might have it stuffed and keep it as a memento. On examination, however, I gladly arrived at the decision that the specimen before me was another individual. It was rather larger, and the tips of its tail-feathers were perfect, whereas my bird had ruffled his by his movements in the cage.

*July* 30*th.*

On my return home after a week's absence I was much surprised to find that the Flycatchers had repaired the nest in the rose-tree and were about to rear a new brood: three eggs had been laid, and the female bird had begun to sit. Since the departure of the Cuckoo a scaffolding had been erected round the house and painters had been at work. In spite of the noise and constant presence by day of these workmen, the birds preferred the nest in which they had reared their great 'booby' to any other locality.

*August* 9*th.*

This morning a young Flycatcher was hatched, and in the course of the day a second.

*August 18th.*

I have repeatedly observed that the Flycatchers seem more afraid of me than of any of the workmen. The latter walk about the garden, often passing within a few yards of the nest, yet the birds seemed to take no notice of them; but I scarcely ever go out of doors without seeing the old bird fly off and take its post in the apple-tree. Can it be that the old birds remember my intrusion on their domestic privacy in the days of the Cuckoo, but have less fear of strangers who have never interfered with them? Last night the temperature fell so low that, having gone into the garden about ten o'clock and seen a clear sky with the stars twinkling, I came in and said in jest, 'A fine frosty night.' This morning it rained very heavily for many hours without intermission. About mid-day I looked into the nest, and was surprised to find it thoroughly soaked with water, the mother absent, and the two young ones wet, cold, and as I thought dead. I accounted for the fact by the supposition that the old birds had been actually driven away by the cold weather or by the impossibility of finding insect-food. That the temperature was unusually low last night was clear from the fact that a tender annual in my garden hung down its leaves as if frost-bitten. In the afternoon I visited the nest again to take out the third egg, which was addle, when I perceived from a slight motion in one of the young birds that it was not quite dead. Accordingly I took it out, placed it in a Chaffinch's nest which I had by me, removed it into

the house, and laid it by the fire. In a few minutes the warmth restored it, it opened its mouth, and with some little coaxing was prevailed on to swallow several house-flies. It is now quite restored to vigorous health, and sleeps cosily in the nest covered with a swaddle of cotton wool. I purpose rearing it, and, if any warm weather should come, of giving it its liberty, or, if it should seem patient of confinement, of keeping it through the winter. I have not seen a Flycatcher all day, and only one or two Swallows; not a single Swift, though I observed one last evening. A Chiff-chaff, which pays me an annual visit, has for several days past been busily occupied in clearing of aphides the rose-trees trained against the house, and now and then catching a fly or other insect outside the panes of the dining-room window. The severe weather cannot be without effect in checking insect life: the Chiff-chaff has probably discovered that flies are abundant now near this house, its favourite hunting-ground in early spring, as I have noticed elsewhere.* I cannot say positively that it is the same bird; but as I never see more than one, and that one always frequents the same shrubs and the same windows, I have a strong opinion that it is the same.

*August 19th.*

This morning the young Flycatcher was found dead in the nest, there being a suspicion that it was poisoned. Among the flies which composed its last meal was one that had been picked up dead in the

* *British Birds in their Haunts.*

kitchen, and this there is every reason to suppose had been itself poisoned by regaling on Papier Moure. The old birds have not been seen since the day before yesterday. We conclude, therefore, that they have migrated southwards. The nursing of their second brood was probably deferred till too late in the season by the protracted feeding of the young Cuckoo, and the migratory instinct was so strong that it overcame even that of nursing their brood, as is known to be frequently the case with Window Martins. On examining their nest, which had in the first instance been lined with the withered blossoms of the Oak, I found that it had been lined anew with horse-hair, a feather or two, a piece of twine, and some of the feathery awns of *Stipa pennata*, a good deal of which lay scattered about the garden.

*Sept.* 10*th.*

A single Flycatcher returned to-day to the old haunt in the apple-tree, made a few flights, and disappeared.

*The Water Ouzel.*

Should this volume fall into the hands of any patient and accurate observer who happens to reside in the neighbourhood of a tarn or mountain-stream frequented by Water Ouzels, he would confer an important service on Natural History by watching and recording the subaqueous habits of these birds. It is positively stated by some naturalists that the Water Ouzel has the power of walking

along the bottom of a river or lake without plying its wings. Others say that the statement is erroneous, grounding their denial of the fact on the position that such a feat is physically impossible. The body of a bird, they maintain, being specifically lighter than water, can only be kept submerged by strong muscular exertion. This latter theory seems to be sound in principle; yet, on the authority of competent and trustworthy witnesses, the Water Ouzel offers in its daily habits an example of an apparent violation of an undisputed physical law.

Though I have myself often seen the bird perform its aërial flight, I have never had an opportunity of watching it beneath the water. Other observers have been more fortunate. Mr. St. John says in his entertaining 'Wild Sports in the Highlands':—

'At other times the Water Ouzel walks deliberately off his stone down into the water; and, despite of Mr. Waterton's strong opinion of the impossibility of the feat, he walks and runs about on the gravel at the bottom of the water, scratching with his feet among small stones, and pecking away at the small insects and animalcula which he can dislodge. On two or three occasions I have witnessed this act of the Water Ouzel, and have most distinctly seen the bird walking and feeding in this manner under the pellucid waters of a Highland burn.'*

A similar account by Dr. Kinahan, read to the Dublin Natural History Society, is too long to quote;

* St. John's *Wild Sports in the Highlands.*

but the author states: 'When seeking food it generally goes down, like most divers, head foremost, in an oblique direction, or else walks deliberately in from the shallow edge of the pool, the head bent down, and the knees crouched.' To prove that the bird does actually possess the power of walking under water, he goes on to describe a chase of a bird which he had fired at and wounded by breaking one of its wings: 'On my going to seize him he darted into the water, running slap in. I waded in after him: under water he looks quite glossy. When I first got up with the bird he was perfectly stationary at the bottom, not using any exertion to remain there: he seemed to move now altogether by means of his feet, his wings hanging down behind his tail. The bird's progression along the bottom was certainly by means of its feet alone.' This evidence of two competent and veracious observers cannot but carry weight; yet Macgillivray, an equally unexceptionable authority, says: 'I have seen it moving under water in situations where I could observe it with certainty, and I readily perceived that its actions were precisely similar to those of the Divers. It in fact flew, not merely using the wing from the carpal joint, but stretching it considerably, and employing its whole extent, just as if advancing in air. The general direction of the body in these circumstances is obliquely downward; and great force is evidently used to counteract the effects of gravity, the bird finding it difficult to keep itself at the bottom, and when it relaxes its efforts, coming to the surface like

a cork. The assertion of its walking in the water, on the bottom, which some persons have ventured, is not made good by observation, nor countenanced by reason and the nature of things.'

Such is the present standing of this much-disputed question, which scarcely admits of any easy solution.

*June 20th.*

"It is not every dweller in the country who can discriminate to a certainty between the song of the Blackbird and that of the Thrush. The following hints may perhaps assist a listener desirous of deciding which of the two is performing:—Most of the notes of the Blackbird are uttered in a loud flute-like whistle; the Thrush also pipes, but in a less mellow tone, and its song is interspersed with passages which partake of the nature of a chirp rather than of a whistle. The song of the latter bird is further characterised by the iteration of short passages, composed each of from two to four notes. Precisely the same strain is repeated four or five times without any intercalation of other notes. The performer then drops the theme, and after a short discursive passage takes up another, which it treats in the same way, and then abandons it for a third. Before it has gone through its whole repertory it returns to one of its favourite strains, and again rehearses other previously heard passages; but observing no regular order, and repeating more frequently than the rest some one particular combination of notes, which, though common to all birds of the same kind, is evidently the favourite

lay of the individual bird. The Blackbird, on the contrary, after once uttering his favourite strain, which is generally longer than that of the Thrush, takes up another subject before he repeats it. His song contains iterations, indeed; but after each musical passage has been once repeated there comes either a pause, or a sequence of piping notes, which fall on the ear without rhythm.

A few days since I was superintending the lading of some wagons with furniture, and was in and out of the house at short intervals during the whole of a pouring wet day. A Blackbird had stationed himself on the top of a tree hard by, and seemed resolved to sing on until fine weather returned. The burden of his song was the following passage, which was repeated so often that, if one could tire of natural music, I should have been tired then:—

All its other strains were unmetrical, and there seemed to be in them no melodious arrangement of notes; so that the general effect was nearly what would be produced by a person talking in his natural tone of voice, and repeatedly introducing a snatch of an old song by which his memory was haunted, though he was unable to recall either the words or the melody of the remainder.

A child might fancy a Thrush to be saying at intervals of its song, Bo-peep, Bo-peep, Bo-peep, Bo-peep—how d'ye do, how d'ye do, how d'ye do—

Judy, Judy, Judy, Judy, Judy—what a pity, what a pity, what a pity—Judy, &c.

A Blackbird's song is not so easily translated into spoken words; though I have heard a particular bird frequently introduce a passage which ludicrously resembled the concluding notes and words of 'Jump Jem Crow.'

The Missel-Thrush has a powerful and clear song, which may be distinguished by being more disjointed than that of the Thrush and Blackbird. Each passage of from four to six notes is most frequently followed by a pause and total cessation of sound. One might imagine it to be listening for the echo of its own voice.

*The House Sparrow.*—What were the habits of House Sparrows at the period prior to that in which men first began to live in houses? Original Sparrows may have been solitary and timid birds, frequenting forests and heaths, living only on insects and the seeds of wild plants, and in the course of ages may have instinctively discovered that abundance of congenial food and protection from predatory animals were the results of establishing themselves in the neighbourhood of man. This instinct may have become stronger from being habitually followed, until, confirmed by hereditary descent through a thousand generations, it may now be as much the characteristic of a Sparrow to court the society of man as it is that of the Plover to shun it. Thus much we well know, that the animals which have been thoroughly domesticated, such as the Dog, the

Sheep and the Ox, though once, we may presume, wild and untamed, are now fearless of man, without teaching or training, and that the Sparrows in cities, old and young alike, are far more familiar with him than those bred in remote hamlets. It would be an experiment worth trying for some one to transpose the eggs of a Covent Garden and a Highland Sparrow, and to observe whether the produce in either case differed at all in habits from their foster parents.

So dissimilar outwardly, too, are the two types of the bird, that it is hardly to be conceived that one could replace the other without previously undergoing a course of educational training. Dwellers in cities, who know the Sparrow only as 'a ball of feathers and soot calling itself a bird,' must be prepared to see, in the country, examples arrayed in colours so bright that they will hardly recognise them. A Cock-sparrow, readily distinguished even while flying by his handsome gorget, and the red, brown, and black of the feathers on his back, is quite a rustic beau, strictly neat in his person, as proved by his frequent washings in ponds and wayside puddles. In dry weather, when water is not to be had, like the Mahometan in the desert he goes through the motions of ablution, crouching and fluttering all the while in the deepest dust.

Town Sparrows, in spite of their sooty aspect, are tolerated, and even encouraged, as being the sole wild representatives of the class Aves. In the country they have few friends: no arguments, no evidence,

no facts, will convince the English yeoman that a bird which attacks his ripening corn and plunders his sheaves during six weeks of the year, can compensate for the mischief by eating grubs and the seeds of weeds during the remaining forty-six weeks; for to this strait is he annually reduced. Nor does the householder who has no corn to lose look on him with at all more loving eyes. Sparrows formerly resorted to thatched cottages in the breeding season, and ensconced themselves under the eaves, where they hollowed out snug but unsightly caves, in defiance of the most vigilant watching. Now that slates and tiles have superseded straw as a roof, they still continue to do what mischief they can, preferring to every other place a spout intended to convey rain-water to a cistern, and generally constructing their massive nest in such a way as to stop the flow of water, to divert it from its course to some ornamental ceiling, or to necessitate the pumping away of all the water from the cistern, in consequence of its being corrupted by the nest being carried bodily, with the eggs or young birds, into the reservoir intended for the summer's store.

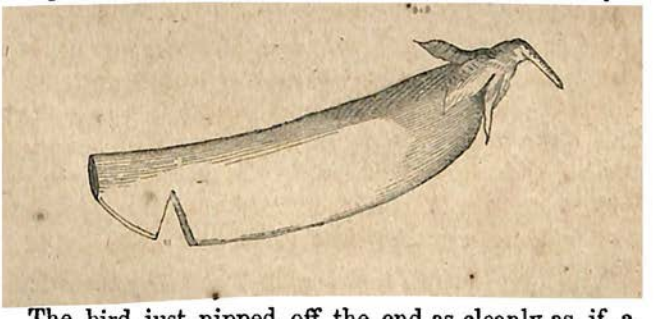
### *July 5th.*

A neighbour told me, last evening, that he had saved a row of peas in his garden to supply a choice dish for some friends whom he expected from London. The friends came, but the peas could not be produced: a family of Hawfinches had found them out on the previous day and rifled every pod. Remem-

bering the adage: 'Tua res agitur, paries cum proximus ardet,' I have just taken a survey of my own garden. The gardener told me a day or two since that he had seen Hawfinches about, and on enquiry I found that his boy not long since took a nest of young ones from a laurel tree close to the house. This intelligence annoys me; for, though green peas are among the nicest of vegetables, the satisfaction of rearing a brood of Hawfinches close to one's house is worth some sacrifice. But this nest with the brood had been destroyed, so the party which had been seen in my garden must have come from another nest. Only a few years since Hawfinches were considered great rarities, and the discovery of a nest in England was an uncommon event; but of late years their numbers have, in some districts at least, greatly increased. Their eggs have been frequently brought to me. Stray specimens are of common occurrence among the spoils carried off by the men set to watch the orchards in the neighbourhood when the cherries are ripening, and they have frequently been seen in my own garden.

I used to be of opinion that their food consisted mainly of the kernels of stone fruit and the seeds of the fir tribe, as I have seen them employed in picking up and eating something that they found under the branches of spruce firs, and cracking the stones of laurel berries. Places have also been pointed out to me in cherry gardens where they have been busily at work splitting the stones of the fruit, and testifying their industry by their chips.

An inspection of my peas to-day has, however, proved that they vary their diet, to my cost. Two rows of peas had been visited, and nearly all the produce which had arrived at a state fit for gathering for the table appropriated by the birds. The plan of proceeding appears to be this. A bird alights on a stalk close to a pod which has attained its full size, and with his powerful bill nips the front, or curved, margin of a pod. If the latter be young and flat, a piece is cut out exactly the size and shape of the cutting edges of the mandibles, and the bird, finding that the peas are not formed, leaves it and goes to another. One which I gathered has been treated somewhat differently.



The bird just nipped off the end as cleanly as if a knife had been used. Finding nothing, it made a notch a little farther up, and, being still unsuccessful, passed to another subject. This was treated in like manner, but, as it contained well-formed peas, was subjected to another process. The bird now attacked the back of the pod and nipped it upwards of a dozen times—until, in fact, the lower side presented the appearance shown in the following cut.

These marks I suppose to have been made by the lower mandible. The upper side of the same pod had given way under the pressure, had been picked open, and more than half of its contents extracted, presenting the following lamentable aspect.

*July* 20*th*, 1862.

One of my pupils to-day while fly-fishing hooked a large trout, which, after having given some play, broke away, carrying the fly with it. About an hour afterwards he dropped a hook with a worm into the same pool and pulled out a trout, which had the identical fly sticking in his jaw. It is not unusual to catch trout having in their mouths flies which have been taken on previous days; but an angler must not reckon on always recovering his tackle so speedily as in the above instance.

I have heard of a hook being recovered in a still more singular manner. 'A boy was fishing in a Scottish river with a worm, and, owing to some defect in the tying, had his hook carried away by a fish of no great size. Another of the party who was trolling soon after caught a pike, which was carried home and handed over to the cook, who, on opening it, found in its belly a small trout, having still the lost hook in its mouth.'

I observed to-day a flight of twenty Missel-thrushes high in the air, not closely packed, but in open order, after the fashion of Fieldfares, for which I should probably have mistaken them had the season been winter. Three or four families had perhaps visited one of the neighbouring cherry orchards, and had subsequently associated from the common motive of discovering another equally tempting feeding-ground. The number of Blackbirds killed by the watchers in the cherry-orchards has been unusually large this year. The Starlings have not yet made their appearance in their customary large flocks. Many Missel-thrushes have also been killed; the latter are in Herts called 'Pigeon-felts,' or simply 'Felts,' a corruption, I presume, of 'Fieldfares.'

*July* 23*rd*, 1860.

Walking under the cliffs at Hunstanton, Norfolk, this evening, I observed a number of Window-Martins' nests built under the projecting ledges of rock. The birds were hawking for flies along the face of the cliff. Macgillivray it is, I think, who doubts the fact

that these birds ever build in such situations. I have observed several instances before, but cannot exactly recall the particulars.

*July 24th.*

Observed a singular instance of the fearlessness of human beings exhibited by a Swallow. I was walking along the sands, the weather being exceedingly inclement—wind from the north, and pouring rain; not a fly or beetle to be seen. A Swallow, which was hawking a short distance in front of me, showed no symptoms of alarm as I approached; on the contrary, as if taught by its instinct that the steps of a man would dislodge the flies concealed among the shingle, it flew towards me, coming almost within arm's reach, veered away a little first to one side and then the other, wheeled round me and headed me again, as if it intended to oppose my advance. Had there been any place near in which its nest could have been placed, I might have imagined that its object was to entice me away from the neighbourhood; but neither wet sands, nor a ridge of pebbles, nor a tuft of sea-grass, is a probable site for a Swallow's nest. Whatever were the bird's motives, it stuck to me perseveringly for a minute or more, and then pursued its chase along the beach, and after all, I fear, with little success; for the wind, which blew directly from the sea, could have brought it no food, and the weather was far too inclement to tempt flies to gambol on the sea-shore.

Observed three Lesser Terns fishing in a large pool separated from the sea by a bank of sand. They

wheeled about at the distance of some 20 feet from the water, occasionally hovered like a Kestrel for a few seconds, dropped perpendicularly into the water, and without diving returned to their aërial position. The birds were but little scared by the report of a gun, removing to a short distance only, and continuing their fishing. What their prey consisted of I could not see; certainly something small, perhaps shrimps. We returned in the course of half an hour, and found them still occupied in the same way.

*July 26th*, 1860.

This evening, about 8 o'clock, as I was strolling up and down in front of the hotel at Hunstanton, which stands on the cliff within two or three hundred yards of the sea, I noticed several beetles (*Rhizotrogus solstitialis*) which seemed to come from the grass of the adjoining field, and with the usual drony flight of the tribe took a common direction towards the hotel. In the course of half an hour their numbers had increased to an extraordinary extent. The principal points of attraction were the chimneys; there they literally swarmed as I have never seen insects swarm, except a colony of bees in quest of a new settlement. Two or three rose-trees trained against the house were covered. With a single sweep of the hand one could catch several, and there were as many left. Half a dozen or more would rest on one's clothes at once, and if swept away would be succeeded by others. The people staying at the hotel shut their windows, but in vain: the beetles came down the chimneys, and

rattled into the grates. In the room where I am at present writing there are many, some buzzing in the window, some crawling on the floor. They are brown, like cockchafers, but about half as long. The evening is still, after a high wind from the north-east; the two previous days having been wet and stormy. The air being chilly, they may be attracted to the house by the heat radiated from the brickwork. At a quarter past nine o'clock the insects were resting in numbers on the creepers about the house, but the hum about the upper parts of the house has greatly decreased. Inside they are annoying me (now that it is dark outside) by intruding on my paper; they gain admittance down the chimney.

*July 28th.*

On retiring to my bedroom, an opportunity of studying entomology was afforded me which I would gladly have dispensed with. The window-sill, dressing-table, carpet, grate, and even the bed, were strewed with the disagreeable creatures, all in a semi-torpid state, and therefore easily caught, but unpleasant to deal with, either by crushing or forcible ejection through the open window. About a hundred, perhaps, were thus disposed of; but early in the morning I was many times disturbed by the droning flight of those which had escaped my notice the night before. After breakfast I went out to see if any remained of the thousands which had swarmed about the house on the previous evening. None were left except the killed

and wounded, and these were being demolished by the poultry belonging to the hotel. Such visitations are, I am told, not unusual here; insomuch that some people find it necessary to shut all their doors and windows in the evenings when the beetles abound, and to light fires. Last evening a roll of brown paper was burnt in the chimney of my room—without effect, however; there was another gathering about the same time as on the previous night, and I had to slaughter a large number before I ventured to go to bed.

A servant at the hotel told me that they are called popularly 'Midsummer bees,' and that they usually remain about a fortnight or three weeks.

*July 27th*, 1862.

I saw a letter from a lady in Wales, stating that she had visited the nest of a Golden-crested Wren, near her house; and having taken out a young bird to examine, the mother suddenly made its appearance, and, with perfect fearlessness, alighted on her hand, and fed the young one as methodically and unconcernedly as if it had been in the nest. I have frequently noticed the indifference of this bird to the presence of human beings, having often stood and watched it flitting about a hedge or tree within a few feet of me; but such familiarity as that instanced above is unusual in birds that have not been previously tamed.

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## *An Ornithological Fable.*

'There exists,' says Pliny, 'a natural animosity between certain birds — as, for instance, between the Crow and the Kite, and between the Eagle and the Trochilus (our Goldcrest), because the latter is called the king of the birds.' It would amount, no doubt, to the crime of high treason in any bird to dispute the sovereignty of the Eagle; but surely the largest and most powerful of European birds has no real occasion to dread the pretensions of the smallest and weakest. Wisdom, however, is better than strength, as the following ancient Greek fable satisfactorily proves:—'Once upon a time the throne of Bird-dom was vacant, and the whole feathered tribe led lawless lives. Jupiter, displeased at the state of anarchy, and not being clear in his mind which bird the regal dignity would most become, promised the sceptre to the one who should fly nearest to his own supreme court. When the edict became known there was some commotion at first, but it soon subsided. The Divers, Swimmers, and Climbers put in no claim, and retired to private life; the heavy-bodied and short-feathered among the others soon joined them; the Heron, in spite of his tiara, resigned his claim rather than compete with the Goshawk; the Lark, though he had great confidence in his soaring powers, disliked the notion of a contest in which he would have the Merlin for a competitor; and it so fell out, that one retiring for one cause and one for another, the number of

candidates for the ornithological purple became limited. The Trochilus kept his own counsel, but his hopes were not small. On the appointed day the candidates all assembled in a certain meadow, the Eagle holding the most prominent place, and close behind him the Trochilus—unnoticed, for he was very little, and he made himself less by crouching in the long grass. On a given signal the birds rose simultaneously, the Eagle with extended tail, and unconscious that he was assisting a rival to gain the victory; for the knowing little bird, just as he was on the point of rising, had perched on his upper tail coverts, and, skilful as he is at climbing, kept a tight hold there. How high they soared, and how long a time the course took, is unknown. Suffice it that the Eagle at length distanced all competitors, and having been for some time distressed by the extreme rarification of the air, and, moreover, being so sure of success that to soar higher was an idle labour, folded his wings and began to dash towards earth. Now was the time for the Trochilus to display the amount of wisdom compressed into his little head. Noiselessly springing from his perch, he fluttered to the knees of Jupiter, and claimed the sovereignty. The god, not too well pleased to find his armour-bearer thus overreached, was bound to acquiesce. The Trochilus was hailed as Regulus (little king), and has ever since worn a golden crown as a symbol of his office.' Such is a modernised very ancient apologue, which the reader may believe or not, as he likes.

*July 28th*, 1862.

All day yesterday from early morning until dark there was a little bird perched among the upper branches of an apple-tree in the garden, uttering at very short intervals a monotonous plaintive chirp, which distressed all who heard it. No one could catch sight of the bird, and no one could decide whether it was a Bullfinch or a Greenfinch. This morning a young Bullfinch was found dead under the tree; starvéd, probably, in consequence of its parents having been shot in the deadly war now carried on against all birds in the neighbouring cherry orchards. A probable contingency of this kind makes the killing of birds in summer specially liable to the imputation of cruelty.

Last evening, one of the very few we have had this year which can be characterised as summer evenings, I heard the distinct screaming of Swifts overhead. I could not see them; but younger eyes discovered a party of six or seven gambolling in the blue sky, reduced by distance to the size of mere specks. They must have been some thousands of feet above us. The air still and warm. The high flying of the Swallow tribe in the evening would seem, then, to be really an indication of fine weather.

I observed on the previous evening that small moths disturbed in a corn-field flew up rather than horizontally. Of course, where winged insects fly, there Swallows hunt.

*August 4th.*

A young Garden Warbler was shot yesterday in a neighbouring cherry orchard, having on its beak unmistakeable evidence that in the fruit season it is not exclusively an insect-eater. Black cherries are a tell-tale fruit; at this season, not only are the beaks of birds stained of a dark purple hue, but every child one meets declares, without opening his lips, how abundant and popular is this wholesome fruit. But children are not the only cherry eaters; if you meet a grown-up person in this neighbourhood, and hazard the assertion, 'You have been eating cherries,' ten to one that the party addressed grins a confession, and, to prove the charge, shows his blackened teeth. Two years since, a high wind set in at the time when the black cherries were ripe, the effect of which was that the ground was thickly strewed with them. My cherry-trees stand in the same meadow in which I keep my cows. These speedily fell in with the popular taste: they lost their relish for grass, and picked up the scattered fruit with surprising adroitness, presenting a rueful appearance as to their lips.

Cherry-gathering is looked forward to in this neighbourhood as a regular harvest, and the labourers show as much anxiety about the probable abundance of a crop as they do about the crops of hay and corn—perhaps even more; for, whereas they are paid by the acre for cutting hay and corn, and the number of acres to cut is the same whether the crops be large

or small, they are paid for cherry-gathering according to the number of dozens (of pounds) they pick. The occupation is a pleasant one, being by no means laborious, yet highly remunerative. Long ladders are planted against the trees, which are surrounded by men and boys armed with baskets and hooks. Several men are often to be seen perched in the same tree, near enough to each other to hold conversation. They laugh and sing right merrily meanwhile, and no doubt often refresh themselves with a taste of the fruit, which not only quenches thirst and clears the throats of the vocalists, but is nutritious food. As each one fills his basket, he descends and empties it into a large hamper left at the trunk of the tree. The hampers, when nearly full, are covered with fresh fern leaves, and sent off in the evening or next morning to supply the London market. The crop varies greatly in different years. A good crop is most advantageous for the gatherers, who are paid according to the quantity; a moderate one is most profitable to the owners, who obtain a price proportioned to the scarcity of fruit. Last year, owing to the severe frosts in May, all fruits were scarce, and consequently dear. Of cherries there was but a moderate crop, but they fetched a high price, and the proprietors made a good profit. This year fruit of all kinds is abundant. Cherries are plentiful, but, having to compete with other kinds of fruit, are so cheap that they scarcely pay for picking and carriage. This year twenty-eight pounds fetch in the market the same price that was paid last year for twelve pounds.

No one of the common fruits is so rarely eaten in perfection as cherries. Strawberries, raspberries, gooseberries, and currants, are perishable enough, and, the first two especially, ought to be gathered and eaten at once — and so they often are, for they grow in most gardens; but cherries are less frequent, and are grown, mostly to a limited extent, on trees trained against a wall in the gardens of the wealthy. Those which are sold in the market have been packed and shaken and unpacked, and tumbled from basket to basket, and handled so many times that they have lost the charm of freshness and almost their distinctive character. They are little better than clammy shrivelled skins, containing a mawkish sweet pulp and a large stone. But to plant a ladder against a tree as big as an oak, to mount ten or a dozen rounds, to turn round and lean against the bars, to pull towards you a branch thickly hung with dangling balls black as jet, smooth as glass, filled with juice, liquid, gushing, luscious, and to feel assured that however many you may eat, you have no worse effects to dread than the spoiling of your appetite for the next meal — this is an enjoyment which it would be unfair to call sensual. It ranks with nutting, bilberry-gathering, shrimping, angling, and other amusements which are pursued, not for the sake of indulging the appetite, but as fascinating pastimes.

*Starlings.*

As far as my observation has extended, Starlings habitually congregate earlier in autumn than any other birds. For a short period after the young broods have been reared they are seen only in small parties, but as soon as the cherries begin to turn red, many families unite into a flock, and explore the country far and wide for suitable feeding-places, their diet having been up to this time exclusively worms and insects. We need not go so far as to suppose that these foraging expeditions are confined to a survey of the orchards likely to supply them with fruit further on in the season, for, as it is proved by the repeated returns of migratory birds to their old haunts that birds are strongly gifted with memory, there can be no doubt that the patriarchs of the flocks remember where they reaped their richest harvests in past years. That they really watch for the ripening of this crop in my own neighbourhood I firmly believe; and I have little doubt, moreover, that if they were not interfered with, they would, with the assistance of Blackbirds, Thrushes, and Missel Thrushes, appropriate the total produce. The first taste of the juicy fruit seems to whet their appetites to desperation. Nothing will satisfy them but a continuous and unvaried feasting on the same luscious fare.

The robbery cannot even be palliated, as Meyer endeavours to do, by the plea that they plunder in order to feed their young, for these are full

fledged before cherries ripen, and the young birds are among the most persevering of the marauders. Waterton's avowal, that they are innocent of the charge alleged against them of stealing the eggs of Pigeons and other birds, may be correct; but every cherry-grower in Hertfordshire, and, I doubt not, in other counties, will maintain from woeful experience that, unless his trees are watched from sunrise to sunset, by the time that his fruit is ripe for the market, not enough will be left to pay the cost of gathering. Early in the season, shouting and screaming from morning to night are found sufficient to deter them; but when the pertinacious birds have discovered that these are but idle noises unattended with serious consequences they become more bold. To the band of screaming boys it then becomes necessary to add men armed with guns, and for many days the popping in all directions is almost without cessation. But when all hands are required for the gathering, and the guns are of necessity laid aside, there begins a race between the owners and the thieves as to which shall have the larger share—birds and men gathering simultaneously from the same tree.

I have sometimes approached the Starlings so closely, while they have been banqueting, that I have almost been able to touch them with a walking-stick; and more than once I have descried a party of young birds busily occupied within a few yards of a man perched on a ladder and furnished with hook and basket, working against time to secure his legitimate

share of the produce. Some of my readers, who perhaps have seen a *flock* of Starlings, but never an *army*, may think the foregoing account exaggerated; but it is not so. An instance occurred last year of a gentleman having given orders one evening that the fruit of a certain tree which stood detached from his orchard should be gathered next day. Next day arrived, but the work had been completed before his labourers could begin. A flight of Starlings had been beforehand with them, and in the course of two hours had devoured or destroyed fruit which it had been computed would occupy several men for a whole day.

When the bulk of the crop is gathered in, there still remains a sprinkling of damaged and scattered fruit; the Starlings are no longer interfered with, and for a few days they resort to the trees in such numbers that on the firing of a gun there will suddenly rise from the trees a multitude, the wheeling of whose flight and whizzing of whose wings for a moment bewilder one. The average number of a brood of Starlings being five, we should expect to find these summer flocks to be composed of young and old birds in the ratio of ten to four; but I have often examined the masses of slain at the close of a day's campaign, and have been surprised to find that nearly all were young birds—among fifty, perhaps only six were full grown.

## ISLAY.

*August 23rd*, 1861.

I have been staying for the last three weeks at Port Askaig, situated on the western shore of the Sound of Islay, in the island of the same name. A respectable inn, a shop which would have delighted Robinson Crusoe, a post-office—and attached to it a warehouse devoted to the reception of goods landed from or intended for the steamer Islay, a quay, and a basin containing a life-boat and one or two other small craft, constitute Port Askaig. There is a ferry hence across the Sound to the Island of Jura, and passengers, mail-bags, and cattle are conveyed across as often as occasion requires and the weather permits. This last proviso is a necessary one, for the Sound is no more than half-a-mile across at this point, and the tide forced into this narrow channel runs, when at the top of its bent, at the rate of six miles and a half an hour. Consequently, when the wind is high and blows in the same direction with the run of the tide, a boat attempting to cross would be carried up or down the Sound instead of across; so that it is only when the weather is calm, and wind and tide counteract each other by coming from opposite directions, that one can make sure of a passage.

The ferry-house on the opposite side is distinctly visible, and a few loiterers on the beach: an under-keeper, perhaps, belonging to the deer-forest of Jura, or a party of Highland drovers awaiting the arrival of the ferry-boat. The opposite shore is edged by low cliffs, broken here and there by a water-fall or dyke of basaltic rock. From these edges sweep upwards tracts of heaving land, at this season purple with heather; and above all rise the 'Paps of Jura,' three conical hills, which, though the highest land in this part of Scotland, appear less lofty as seen rising directly from the sea than they do when their base is hidden from sight by hills of meaner pretension.

Port Askaig is not an exciting place to stay at; so there are few visitors and no 'handsomely furnished lodgings' to tempt them. Once a week a steamer arrives here from Glasgow, bringing passengers and goods, and makes a stir which is not altogether agreeable. The appointed hour is 11 o'clock at night, and the hour of departure 8 o'clock the next morning. A large portion of the population of the surrounding hamlets assemble to receive their friends, to overlook the landing of their goods, or to get their letters. The quay is noisily occupied all night by porters, sailors, carters, and drovers, many of whom find their way to the inn, and while discussing their whisky, scream and scold in Gaelic; or, if more harmoniously disposed, join in a Gaelic chorus, accompanied sometimes by a bagpipe or Jew's-harp, but having the melody less marked than

the time — the latter being loudly, if not accurately preserved, by a diligent thumping with sticks on the table. Among the melodists is to be found one individual who, when the drink has begun to take effect, indulges in a fit of weeping and sobbing for the loss of his mother, who, he tells those who understand him, 'died eleven years since.'

Once or twice a week a half-decked sailing-boat arrives from the neighbouring island of Colonsay, bringing the mail-bags, a few boxes of herrings, and perhaps a passenger or two, who, as the weather has been wet and stormy of late, look drenched and dismal. More frequently, small fishing-boats, each with a crew of two or three men, come in with a cargo of lobsters, which are counted over, and duly consigned to the steam-packet agent, to be deposited in boxes and let down into the water off the quay until the next arrival of the steamer. Many hundreds of dozens annually find their way from this obscure port to the principal cities of Scotland and England. They require careful treatment in order to arrive in good condition at their destination. Their claws must be tied to prevent them from crushing each other, and they must be protected from rain, as fresh water kills them instantaneously. In consigning them to the contractor, all those below a certain size, and those which have lost a claw, are counted as half-fish, while dead ones are rejected as unsalable.

Owing to the strong set of the current through the

Sound, the average rise and fall of the tide is not more than seven feet; and, when a strong wind sets up or down the channel, even less; consequently, there is always plenty of water at the pier head, and the basin is never dry. Shoals of small fish, principally Sethe and Lythe, at this season frequent the vicinity of the shore, and are caught by children with a hook and line, the bait being a raw Limpet, which is considered to be more attractive if it be chewed previously to being placed on the hook; and it is amusing to see with what indifference the young urchins take out from their dirty baskets a stale Limpet, extract the tough morsel with their grimy fingers, masticate it for a few seconds, and transfer it to the hook. Towards evening larger fish of the same kinds haunt the shore in pursuit of their smaller brethren, which, in their agonizing efforts to escape, frequently spring out of the water with a splashing noise like that of falling hail. At these times the pursuers are deemed a prey worthy of more experienced fishers. The method of capturing them is simple in the extreme. A stout rod, with about twenty feet of line attached, having at the end a 'fly' made with a coarse hook and a bit of white feather or strip of leather, is grasped firmly by the fisherman. The latter throws his fly outwards as far as he can, and dropping the end of his rod into the water, walks slowly up and down the pier, giving the line a wavy motion. The fly, thus unsteadily moved through the water, having to the unwary and hungry fish the semblance of a small Lythe, is seized, and becomes

the destruction and not the victim of its ruthless pursuer.

At certain periods of the tide there are to be seen two or three boats riding at anchor not far from the shore, but always about the same place, one which experience, no doubt, has pronounced to be most favourable. In these are two or three men, each with a rod and line, occupied in the capture of the same kinds of fish. Limpets are the principal bait here also, and the fishing is successful, as I have several times met the fishermen carrying up the hill creels heavy with fish. In default of Herrings, these fish form an important item in the food of the sea-side population. Some are consumed at home, some are sold, or from their livers is extracted by boiling a fine and useful oil, not very different in its properties, I should imagine, from cod-liver oil, nor more unsavoury. It is not, however, used as medicine, but is burnt in the long winter evenings in an iron lamp of antique form, but rude structure, called a 'cruiskin.' For the small sum of fifteen pence I purchased one of these lamps at 'the shop.' At Pompeii a larger sum would undoubtedly have been asked, and, by the unlearned in such things, paid.

On some of the few fine evenings which I had the privilege of enjoying, I fished for Lythe and Sethe in another way. Rowing slowly up and down the Sound near the shore, and furnished with rods similar to that described above, we threw our lines overboard, and suffered them to trail behind us. They were furnished with two or three flies, (I do

not see why a dozen or more should not be employed) and were on some occasions very successful, bringing in two or three fish at a time.

The Sethe or Coalfish* is allied to the Whiting, but less valued as an article of food, being far less delicate in flavour. It is a northern fish, and frequently attains a large size; but those which we captured in no case exceeded a pound.

The Lythe, or Pollack,† differs from the Sethe, in having a projecting under-jaw, and in being of a bright golden colour. It is much better eating—little inferior, in fact, to the Whiting. It is very voracious, frequently springing out of the water in pursuit of small fry, and taking the bait eagerly. Some of those which we caught weighed nearly two pounds, but the majority were under a pound.

At stated intervals, a cattle fair is held in the island, which is attended by dealers from the mainland of Scotland. All the beasts purchased on these occasions are driven to Port Askaig, to be ferried across to Jura, and thence to the mainland. One day during my stay here, upwards of a hundred cattle were driven to the ferry, and in consequence of the stormy weather were unable to cross. The drovers, a hard race, might, if they would, have kept them on the hills above the port, where, by the custom of the island, cattle in transit have the right of grazing; but, there being no whiskey-shops on the heaths, they never stop there under any circumstances, but drive their charge to the sea-shore, where the unfortunate animals must

* *Merlangus vulgaris.* † *Merlangus Pollachius.*

remain without food until ferried across to Jura. For two nights and a day they stood about on the barren shore, without, as I have said, a particle of fodder, green or dry; lowing piteously; occasionally poking one another with their horns, as if in mockery of sport; badgered by dogs, trained, seemingly, to fasten on to their tails by their teeth, and to suffer themselves to be swung round rather than let go their hold; and battered with huge clubs by the drovers, whenever they turned their heads in the direction of the inland road. That the occurrence was common appeared clearly enough, for from morning to night little girls in pairs visited the milch cows, round and round, and over and over, one stroking the famished beast to keep it quiet, the other draining a scanty drop of milk into a tin pan. The sight was pitiable in the extreme; but the worst was to come. Late in the second morning the weather had moderated so far as to allow the ferry-boat to cross, and the poor animals were driven, about ten at a time, by shouts, blows, barks, and bites, to tumble into the boat. I scarcely think that one could have made the passage uninjured, so reckless were the drovers, and so inadequate the means for transporting the cattle. But this process I could not endure to watch, so turned my back on Port Askaig, and strolled along the cliffs.

There being little feeding-ground for birds on a shore where neither sand nor mud is left by the receding tide, I saw but few of the feathered tribe, either Waders or Sea-birds. A solitary Heron might,

however, at most times be observed here and there, standing motionless on a rock just above the water-mark. When in a boat, I found that I could approach tolerably near to these — that is to say, within fifty or sixty yards. To boats containing inoffensive fishermen they were well accustomed; but pedestrians along the shore were suspicious characters, and to these they gave what sailors call 'a wide berth,' fanning themselves away with their broad wings, and uttering, meanwhile, their harsh scream, while I was as yet two hundred yards from them. Of Gulls there were a few, mostly beating against the wind along the shore, and never alighting except to snatch up some floating savoury morsel from the sea. Three or four Cormorants occasionally passed down the Sound, distinguished by their lank bodies and dingy colour. Now and then a Gannet was seen in mid-channel, circling round and round on the search for Herrings, and occasionally descending into the water as if shot, and throwing up a jet-d'eau to a surprising height. One day we descried near the opposite shore a number of white and black birds floating southwards with the tide, occasionally raising themselves as if standing on the water, and clapping their wings like ducks. The telescope revealed to us the fact that these were Puffins, and we were told by an intelligent islander that these birds had been seen in the spring flying northwards, but that while migrating to the south they always swim through the Sound with the tide. Eider Ducks were talked of, and one day we made a boat expedition along the

shore of the Sound to a place which they frequent; but we were unsuccessful: on that occasion they were engaged elsewhere. These birds annually breed on the cliffs of this and adjacent islands, and we procured two eggs, which had been taken in the previous spring.

The first day after my arrival (*July* 31st) was set apart for Duck-shooting; so, the weather being fine, we sallied forth. Our party consisted of the Laird, myself, two young friends, two keepers, and two dogs. The keeper was anxious that this expedition should not be delayed, for the young Ducks, or 'Flappers,' had been able to fly for the last fortnight, and he was afraid that they would either have become wild, or have changed their quarters to some distant lochs. Our course lay over the hills at the back of Port Askaig, and in the hollows between these the Ducks annually breed, building their nests among the bulrushes and reeds which abound in the marshes and pools, and on the shores of the tarns or mountain lochs. The method adopted was for the gunners to station themselves apart from each other, as near as they could to the line of flight which the birds when disturbed would probably take. When all were posted, the keepers sent the dogs into the reeds; and the game thus started ought to have accommodated us by coming within reach of our shot; but the Laird's kindness in putting off the campaign until my arrival somewhat marred his sport. The Flappers, now strong on the wing, were for the most part wild, and made off, the old ones leading the way,

before we approached within gun-shot of the tarns; consequently, our bag in the evening was not a heavy one, containing five or six brace only, and several of these were caught by the dogs before they had time to disentangle themselves from the weeds. Not being myself much of a sportsman, I fear I was more interested in watching the habits of the birds than in bringing them down. I had two excellent shots at full-grown birds as they flew towards me, but forgetting that I ought not to fire at them breast on, but wait till they had passed me, I fired too soon, and the shot (taking it for granted that I hit my mark) did them no harm.

Observing, on one of the larger tarns, two large birds swimming, I examined them with my telescope, and finding that one had the appearance of a Goose, and that the other was a Duck with a black head and white breast, and consequently of a different species from the common Wild Duck,* I crept round the shore, accompanied by the under-keeper, in the hope of getting within reach of them. They soon discovered me, and paddled outwards. The shot was a long one, but worth trying. The shots fell all round the birds, but did not hurt them. The Duck rose, and flew to a distant part of the loch; the Goose continued to paddle onwards, without taking any notice of me. I was about to discharge the second barrel, when a shout from the other side stayed my finger, and my companion suddenly recollected that

* *Anas Boschas.*

the keeper had turned loose on the loch a Bernicle Goose, which had been caught alive in the previous winter, and pinioned. Fortunately, therefore, I was saved from the inglorious feat of shooting a pet Goose. As for the Duck, it was really a wild one, and being shot a few days afterwards by one of the party, proved to be a Scaup Duck, a northern bird common enough in winter, but of very rare occurrence during the summer months. What could have induced it to remain so late in its winter's quarters we could only conjecture. It might, perhaps, have been injured in winter, and, being thus unable to take flight with its companions, it might have consorted with the Bernicle out of pure sociability. If wounded, it had certainly recovered, for it was shot on the wing, and was in a perfectly healthy condition.

On another loch we fell in with a family of Coots. These, when we discovered them, were swimming about in the neighbourhood of a small patch of bulrushes, to which they quickly paddled for shelter. They were not considered worthy game; but the dogs were sent in to hunt out any ducks that might be concealed there. None, however, were found; and, though the dogs traversed again and again every part of the plot of rushes, not a Coot appeared again. The habit of these birds is, when alarmed, to dive, and, after proceeding some distance under water, to raise the tips of their beaks among weeds, keeping the body wholly submerged, and thus to defy the most peering search. To do this they are, of course, obliged to cling with

their feet to the weeds below them, otherwise, being lighter than water they would of necessity float.

The only other birds we saw to-day were—a young Cuckoo, which was very nearly being shot for a Hawk; a young Sandpiper, caught by the dogs; a young Pheasant, which, in its terror of the dogs, fell into the water and was drowned; some Herons, Curlews, Gulls, Water-Hens, a Sparrow-Hawk, and a Merlin.

Herons are unsparing destroyers of Trout, and meet with no mercy from gamekeepers. The Sparrow-Hawk, especially the female, is a deadly enemy to game of every kind, and is treated accordingly. A whole brood of Pheasants had been carried off this summer by the same bird, which has even yet eluded the vigilance of the keeper. The Merlin, I find, is held in bad odour, but I could not discover that it had been actually convicted of poaching.

The Laird pointed out to me, as we were walking round the shore of the largest loch, a vast number of green fleshy substances, of about the size and consistence of the small plum called a bullace. They lay in greater or less quantities among the shingle, close to the water's edge, or actually in the water. Placed in a bottle with a little coloured fluid, they would have passed well for preserved fruits, or 'West Indian pickles.' I had never seen any before, but stated my opinion that they were probably some species of Nostoc. On subsequent examination with a microscope I found that it was *Nostoc pruniforme*. Under a rather high power, the gelatinous substance

with which they were filled was seen to contain numerous jointed threads, each resembling a portion of a necklace. On a subsequent occasion I observed that the water of the same loch held suspended myriads of olive-green particles, apparently of about the same specific gravity as water, as they neither sank nor rose. This alga, I was told, had appeared about six weeks before, and had clouded the water in the same way as on this occasion, but in a few days had subsided. The same appearance has been observed in the artificial lake at Kew and elsewhere, and is referred to a minute alga, *Clathrocystis æruginosa*.

The loch in which these algæ are found is of considerable extent, being a mile long and half a mile wide. It is surrounded by a broad belt of trees, and abounds in submerged weeds (*Potamogeton*) of several kinds. Many years ago, I was informed, before the trees were planted, the Trout in this loch were small, about the same size as those found in the neighbouring lochs, where they average ½ lb. or less. They now commonly run from 1½ lb. to 2 lbs., and are not unfrequently much larger. They are exceedingly powerful, giving as much sport as the strongest salmon-trout, and when cooked are found to be in fine condition, of a deep red colour and high flavour, proving that they have abundance of food. It may not be, perhaps, safe to assign an effect to a chain of causes, but it is in my opinion far from improbable that the growth of the algæ and other weeds may have been promoted by the presence of the trees, and in their turn have encouraged the

multiplication of water-insects and molluscs, the favourite food of Trout, so that the original planter not only conferred a direct benefit on his heirs by planting trees, but indirectly provided them with many a dish of delicious Trout.*

The season for fly-fishing in this loch was nearly gone by, but I succeeded in inveigling a few of these splendid fish by the help of a boat and fine tackle. In another loch, about a mile off, I was yet more successful. This is of an irregular shape, about half a mile across in every direction, having a shingly beach in some places, in others peat, and in one part, where the water is deepest, a steep rocky shore. There are two small islands in it, one woody, the other bare of trees, but covered with heather. Here and there are patches of bulrushes, through which the lightest wind moans drowsily. It is surrounded by low hills, and in the distance the peaks of Jura tower aloft, capped with clouds, or tinted with atmospheric purple. On the shores of this loch I spent a portion of many days. Trout are capricious animals, and the Trout of Loch Lossitt are unusually so; for, unlike other Trout, they rise best when the sky is cloudless, and the sun shining brightly. They are numerous, strong, and of a singularly brilliant colour, glistening, when first taken out of the water, like

* In Herbert's *Fish and Fishery in the United States*, it is said of the Mascalonge (*Esox Estor*), the Pike of the North American lakes: 'It feeds on small gelatinous green balls, which grow on the sides of banks under water.' If this statement be correct, it is possible that the Bally-Grant Trout owe their size and excellence to the abundance of the same kind of food.

Lossit Loch. — Waiting for Sunshine.

burnished copper. The majority were about the size of Herrings, with now and then a larger one, which by his attenuated body showed that food was not sufficiently abundant to keep large fish in condition. For the most part, the weather was unfavourable on every occasion that I visited this water. Showers, continuous rain, or cold winds, were always allowed to be sufficient excuse for my returning home with a basket only half full. But neither rain nor wind kept me away. On one occasion I caught two flies, a brown and a black which I saw fluttering about at the water's edge, and before my next visit did my best to imitate them. The black one was a failure, but with the brown I caught nearly a score of fish in no very long time. Even when my fly was almost bitten away, and the yellow silk with which it was tied was nearly all that remained of the body, still it continued more attractive than any other on my line.

One afternoon I was fishing from a projecting point several feet above the water, with a bank of heather behind me, when the sky, which had been long overcast, suddenly became very dark, and a few drops of rain began to fall. Without delay I donned a light waterproof cape which I carried in my pocket, and stooped down in such a way that it formed a kind of pent-house round me. Not a minute too soon. Presently the big drops pattered on my back like hail on the tiles of a house. The surface of the lake became, as it were, covered with a sheet of animated hoar-frost, the effect being

produced by the rebounding of the shattered drops and particles of water which sprung up to meet them. I was clearly in the midst of one of those violent showers, composed of stalking columns of rain, which one sometimes in summer sees at a distance. As each column passed on, I could see its progress across the lake definitely marked by the thickness of the white coating. After the lapse of about twenty minutes it ceased, but all sport for the day was at an end: the Trout would rise no more.

On another evening, a light shower suddenly came on, preceded and followed by sunshine. The result was, of course, a rainbow, but the most magnificent I had ever seen. Not only was there a perfect bow stretched across the lake, colouring but not concealing the rocks on the opposite side, but the reflected outer bow was also perfect, having, as is always the case, the order of its tints reversed: and the primary bow was composed of a *double* series of coloured bands; the order being violet, indigo, blue, green, yellow; violet, indigo, blue, green, yellow, orange, red. Before the colours had begun to fade away, the rain ceased; the surface of the lake, unruffled by any breeze, became a mirror, and, like a mirror, reflected both bows, the whole presenting the appearance of as many circles of prismatic colours. The phenomenon lasted but a few moments, but left an impression which, I doubt not, I shall find as difficult to forget as to describe in writing.

I usually fished this loch from the shore, but one day I tried my fortune from a boat, a small one for

the purpose certainly, for I was obliged to sit all the while, and consequently had little command of my rod. I began about half-past twelve o'clock by directing my boatman to row me towards a patch of bulrushes, and taking his sculls out of the water to hold on by the weeds. There was a pleasant ripple on the water, and the sun was shining through a thin veil of clouds. The fish rose well, and in the course of an hour and a half I had half filled my basket. But, my legs getting cramped, I made for a little island, with the double object of eating my luncheon and stretching myself at full length on the heather. If any of my readers expect that I am going to moralize on the enjoyableness of such a situation, they are mistaken; and, if disappointed, I recommend them to take down Isaac Walton, and read a few paragraphs. *Mutatis mutandis*, I was honest Isaac for the nonce; but, had he been privileged to be my companion in his own proper person, the 'Compleat Angler' would have contained another pleasant chapter.

My much-relished meal concluded, I basked for a short time on my purple couch, and tried a few throws from the island. Many small fish rose, but only two worth securing, and then came a sudden cessation. A chilly cloud passed over the sun; insects, I suppose, ceased to sport on the water, and not a fish moved. I returned to my boat; but where only one hour ago the water was bubbling with fish, all was now still. I shifted my ground, and tried another patch of reeds. The clouds were by this

time beginning to pass away, and with returning sunshine my sport also returned. The fly which I found most successful was a small, winged brown, with a hare's-ear body, round which I had twisted a particle of gold thread; as close an imitation, in fact, as I could produce of the fly which I had seen on the bank, with the addition of the gold, to represent the metallic lustre so common in winged insects.

About five o'clock my creel was so full that it would hold but two or three more, and I was just beginning to think that my morning's sport was well nigh ended, when a voice reached me from the shore, 'I have brought you your dinner, Sir!' 'Very well,' I replied; 'walk round to the other end of the loch, I will finish filling my basket, and meet you there.' The supplementary two or three were soon killed, and I joined my welcome caterer on the shore. 'Now,' said I, 'for Loch Bally-Grant; I will eat my dinner on the shore, and then try for a big Trout.'

'No, sure, Sir, you will be just eaten up by the midges.'

'Well, then, I can get into the boat and push out, the midges will not touch us there.'

Midges are, towards evening, on the Highland lochs, intolerable pests. They are there in myriads, having a particular affection for the foreheads, eyelids, and ears of fishermen, so small as to be little more than visible singly; inaudible, and so light that they can be felt only by the smart of their sting. It is easy enough to massacre them one by one after they

Bally Grant Loch — The Author puzzles the Midges.

have done their worst, but the vengeance neither allays the present smart nor the subsequent itching, which in some constitutions is accompanied by fever-heat spreading over the whole face. When fishing from the shore, I have found a net-veil of service. It was made with a circular hole in the middle, through which I passed the crown of my hat; the net thus fell all round my face, and I rarely found that any flew up beneath. Perfect vision was of course obstructed; but when the choice lay between being 'eaten up' and occasionally missing a fish, it was easy to come to a decision.

There is another minute fly which one encounters by the side of these lochs, scarcely larger than a midge, but even more numerous. It is also very troublesome to the fisherman, by settling on his hands and face, but it neither bites nor stings. It is one of the *Ephemeridæ*, and its existence in the perfect form is of very brief duration. I have only seen it in the evening, and it dies before night. I was fishing one evening on the shore of a loch, when just about sunset the wind died away and the water suddenly became as smooth as glass. Scarcely a fish had been stirring up to this time, but now the whole surface of the water near the shore became dimpled with those series of expanding circles so dearly loved by the fisherman, which, better than anything else in nature, illustrate the variety of rich living colours resulting from the combination of an evening sky and the shadow of disturbed water. O those expand-

ing circles of gold, silver, and precious stones! Did artist ever set eye on them? A ripe peach and a pearl are dull in comparison. Suddenly I was aware of myriads of these tiny pearl-grey flies filling the air so thickly that it became difficult to breathe without inhaling them. Without sanguinary intentions they alighted on all parts of my person, seeming to prefer my hat and coat, and so thick that, with a sixpenny piece, I might have covered half a dozen. But strange to say, having once alighted, they never rose again. By the time that it had grown dark, my coat was white with them, but by the morning they had shrivelled up, and had almost disappeared. It was at these the fish were rising so ravenously. They were too minute to be imitated by any artificial fly that I had power to make, so that my capture was but small. By throwing a fly lightly, exactly in the centre of a ring where a fish had just risen, I contrived to hook a few; for a fish when taking its evening meal does not analyse minutely the shape and colour of a fly which falls almost into its mouth. But I am digressing. Let us return to Niel and the loch where the large trout are to be killed.

By the time that I had disposed of my dinner and changed my flies for the larger ones which are considered to be killing on this loch, the sun had sunk behind the trees and the surface of the water was perfectly still. I tried in vain all the favourite spots —off this point—near that bank of weeds—not a fish would look at my flies. Indeed a stranger might have come to the conclusion that there were no fish in

the loch, so unruffled was the water. Eight o'clock was come, and not a rise.

'Take the boat into the narrows, where the water is shallow, and let us see if the fish are gone there to feed.'

In the narrows fish were rising, but only small fry not worth catching.

'Take the boat back again; perhaps the big ones are rising now in the open lake.'

So, indeed, they were. Close to a long bank of weeds which lined the shore they were rising freely—great fellows too—in the still glassy water.

'Now ship your oars and let me see what I can do.' Great fish absolutely wallowed in the water close to the boat, but of my flies they took no notice.

'Now row out to the point off the island; perhaps there is a ripple there.'

On the way, I caught a glimpse of a grey gnat flying by me. I drew in the line which was trailing behind me, took off my great tail-fly, and substituted a dun gnat. By this time we had reached the rippled water. I made a few throws, but the fish were not rising here as they were near the shore.

'Once more, Niel, back to the place we have just left.'

Niel dipped his oars in the water. 'Stay,' I cried, 'I have him.'

Out ran my line with the whirr which a heavy fish only can cause. We were close to a bank of

submersed weeds, in which if my prey had taken refuge, he would certainly have escaped.

'Back out gently into the open.'

With gentle violence I prevailed on the fish to follow me, and we now had a fair fight, which lasted for some ten minutes.

'Stand by the net and land him!'

It was growing dark, and I was nervous about the result. The first attempt failed, so did the second.

'Not much under two pounds,' said Niel, as he lifted him into the boat.

'There is light enough to catch one more, and then we will be off.'

Almost immediately another fish rose at the same fly, but missed it and caught the gut. I struck, and whirr went the winch again. This, too, was landed safely, but it had now grown so dark that in extracting the hook the gut was broken and the fly lost. It was too dark to tie on another, so we made for shore, satisfied with our success and having gainedexperience against another time.

### *Hints to Anglers.*

The reader, if an angler, may be helped towards securing a dish of fish by attending to the following hints.

In smooth water, fish with a fine casting line and a small fly: size is of more importance than colour, especially in the evening.

If there are weeds in the neighbourhood, or, when it is growing dusky, whether there are weeds or not,

use a single fly only. When a fish gets among weeds it is more frequently entangled by the other hooks attaching themselves to weeds than by any efforts of its own. To draw out a fish through weeds while there are other hooks hanging loose, is a critical operation; but while fishing with a tail-fly only I have pulled a fish over three pounds in weight through a dense mass of weeds without a hitch. At night, fish with a single fly, because with two or more the line is likely to become entangled without one's knowledge, in which case one might as well angle with a hair-brush. For the same reason, let all the knots of the casting line be tied with fine silk and waxed. Ends of gut left exposed are likely to catch the flies in the act of throwing.

Never use loops for the tail-fly, but let the gut on which it is made be fastened to the casting line by the smallest possible knot.

If you have got hold of a large fish do not reel up at once; hold the rod well up, taking care only to *feel* the fish, but not to pull it. Should it dart towards you, reel away as fast as possible, until you feel it again. If it springs out of the water, let the point of your rod drop instantly, so as to slacken the line and prevent a strain. If, as it falls back into the water, it should touch a stretched line, at once say 'Good-by' to your fish and fly also with such equanimity as you can command, and prepare for another throw.

If you are fishing with several flies or perhaps even with one only, and your fish makes for

weeds, hold him well in hand at all risks. If he should be tightly hooked, you will in either case secure him: but, if slightly, you will in the open water have some chance of killing him; among weeds none at all.

When fish run large never be without a landing-net. I have heard anglers say, 'I never use a landing-net; I can land my fish well enough without.' So you may, if your line is very strong and your fish securely hooked; but with fine tackle you run great risk. No fisherman can plant his hook where he pleases.

I was one day crossing the loch described above, having a rod in my hand, but not intending to fish. I however just threw my fly and hooked a large trout. I had taken no landing-net, and consequently had little hope that I should kill my fish. Luckily the boatman was a smart handy fellow who had his wits about him. I played my fish until it was tired, and brought it close to the boat; he watched his opportunity, and grasped it with his hand so as to insert his thumb into one of the gills. This was better luck than I had any right to expect. Another time I was fishing alone and hooked a trout of at least two pounds' weight. I played it until it was so exhausted that it lay, belly upwards, close to the bank and almost motionless. I grounded my rod and grasped the fish by the middle. It scarcely struggled; but as I had no secure hold it slipped, tail foremost, through my hand, with a jerk which broke the gut. The fish found itself suddenly free, and, to

my great disgust, recovered strength enough to waddle back into deep water, the disappointed fisherman following it, but all in vain.

When fishing from a boat, make as little use of the oars as possible. If the wind be light, leave the boat to itself. If there are banks of bulrushes, moor fast to them, and be ready to back out as occasion requires. If the wind be high and there are no weeds, be provided with a heavy stone to serve as an anchor, and a long rope. Throw the anchor overboard and let out cable at your pleasure. The dipping of oars frightens away all but the smallest fish.

All the 'Angler's Guides,' 'Complete Fishermen,' and other books of a like class, that I have read, agree in recommending the fly-fisher, instantly that a trout rises, to 'strike;' that is, to communicate to the fly a sudden sharp motion, the object being to insure the hooking of the fish. The advice, I doubt not, is sound, the movement being more frequently useful than the reverse; yet, in my mind, the books do not state accurately, or at any rate clearly, the reason why the angler should strike at a rising trout. 'Striking,' I take it, is a sudden twist of the hand, by which, when holding the rod, the finger nails are brought round so as to be opposite the face; or by some similar manipulation the flies are drawn for a foot or more smartly through the water. Some fishermen are quick-sighted enough to keep their flies always in view; they can tell at which fly a fish rises, whether it falls short of, takes, or overreaches the mark. Such anglers, all other things being equal,

are first to fill their creels; they can exercise their judgement in every case according to its circumstances. I am not gifted with such perfect vision, nor perhaps are the majority of fly-fishers. In my case, whenever a fish rises I strike. By so doing, sometimes I lose, and sometimes hook a fish; rarely perhaps I unhook one: on an average, therefore, I believe myself a gainer. I will endeavour to explain myself.

We will suppose the casting line, furnished with its flies, to be moving slowly through the water. A trout rises at the tail-fly, but falls short of it. I simply see the rise, but not knowing the exact place of my fly do not know the relative position of the fish. I strike, but of course, ineffectually; for instead of hooking the fish, I remove the fly farther out of its way. But I can have done no harm; for had I let my fly alone, without striking, it could under no circumstances have found its way into the fish's mouth. If I am fishing in still water, the trout, if hungry, will very probably give me another chance, either at the next throw, or likely enough at the very same. This, then, is a case when striking proves to be of no use.

A trout, again, may have taken the fly into its mouth. The habit of the trout is, when it has caught a fly, to close its mouth on the prey and to turn down instantly. Nine out of ten fish that thus take the fly are probably hooked; that is, they hook themselves. The tenth finds out his error, and either retrieves it by spitting out the deception—in which case a well-timed strike would have secured him; or he gets frightened, and darts

away with the hook in his mouth—in which case also he is captured. If this theory be sound, little good is done by striking at a fish in such a case as this. But mischief may result; for if the fly have fixed itself so as to hold only a slender portion of skin, the sudden strain produced by striking may tear away the holdfast, and the fish may thus escape, though it was hooked. In this second case, then, striking is of little use, and may be mischievous.

But the fish may overreach its intended prey, and this, I think, happens so very often, that this contingency alone should regulate the fisherman's manipulation — in other words, he should always take it for granted that the fish overreaches its mark, and should always strike. In my early fishing days, it often happened that a fish rose at one of my flies, not simply jerking my line, but running it out a yard or more. I used to take it for granted that the fish had the fly in his mouth, and that I had as good as killed him. Sometimes, indeed, my hopes were realised, but more frequently the line became suddenly slack, and my fish was gone. How did this happen? I have no doubt that the trout overreached his mark, and entangled his mouth, not with the fly, but in the gut line to which it was tied. To free itself from this, it wriggled about and got clear. But had I instantly that I felt the jerk, or, better still, instantly that I saw the rise, struck smartly, I should have pulled the gut line through the fish's mouth, and the hook would have fixed itself in his jaws. A crack fisherman, if he will take the trouble

to examine the exact position of the hook in the mouth of every fish he kills, will find that a great many are hooked on the outside of the mouth, especially at the outer angle of the gape, or place where the two jaws meet. It seems to me quite clear, that in all these cases the fish took the line into its mouth, and was caught by the strike. Often, too, a fish is hooked 'foul;' that is, it is hooked in the eye, a fin, the back, the tail. This could scarcely have happened in the course of still-fishing. But suppose the fish to have risen at one of the 'droppers,' or 'bob-flies,' and the line to have been suddenly jerked, a hook nearer the end of the line was very likely to catch it. Whenever, then, a fish quietly moves off with the line, do not conclude that you have hooked it; rather take it for granted that it has the *line* in its mouth, and strike smartly—in all probability it is yours.

I can remember several instances in which this striking was indisputably advantageous. I was fishing in a stream early in spring, and had thrown my fly into a deep pool. A fish took the fly or rather, as it turned out, the line, under water. I struck, and found that I had to deal with a powerful fish. I played it for some time, and finally landed it, but found that I had not hooked it at all. It had evidently risen at one of the droppers, and in striking I had drawn the line through the opening of one of the gills. The fish, alarmed, had darted off, and contrived to twist the line about its body, so as to get the line under the other gill. It had the appearance of a bungling job certainly, but the fish was

landed, and weighed nearly two pounds. On another occasion, when fishing in the same river, I saw a large trout lying in mid-stream, and threw my line over it, before it, behind it, again and again. It was not disposed to rise. I threw once more, in such a way that the stream should allow the line while sinking to fall on its back, and struck. Away darted the fish, and whirr went the winch. I had hooked it in the adipose fin, and after a severe struggle landed it. Fish, when hooked foul, are always stronger than when caught by the mouth. In the latter case, the action of the gills is impeded, and they soon become exhausted. When hooked by a fin, the respiratory organs continue to do their duty, and the fish fights a tougher battle. I once tried to hook in a similar way a jack, which lay basking in some shallow water. That I touched it was clear by the rapidity with which it darted away, and on examining my fly preparatory to a fresh cast, I found that I had stripped off three scales from the jack, and added them to my fly.

A remarkable discrepancy may be observed in books on angling on one point — the daintiness of trout. Some authors will tell you that it matters little what flies you use, provided that you are skilful in throwing, striking, playing, and landing. Others, on the contrary, tell us that trout will greedily take a fly made after a certain pattern, but will turn away in disdain from every other. The fact is, that there is a great deal of truth in both statements. Fish generally, and trout in particular, are capricious

feeders. At one time they will take only one kind of fly, which suddenly perhaps will lose its attractive power and they will not look at it; at another period of even the same day, perhaps, they will rise greedily at anything that has the semblance of a fly. In strange water, I have myself put on three flies as unlike each other as possible, in order to find out the favourite, and have killed a fish with each in alternation, all within a very short space of time. I have then found them to cease rising, and to be satisfied with nothing but a fourth fly, of a totally different make from all. While fishing with this, I have filliped into the water a natural fly which alighted on my sleeve. Thinking that this would be seen and snapped at immediately, I threw my line as near as I could to it, in the hope that as soon as the natural fly was seized my counterfeit would be taken. The result was totally different from my expectation; for my artificial fly was taken, while the reality floated away untouched.

Sometimes, on the other hand, no counterfeit is successful. This is especially the case when the May-fly is on the water. The eagerness with which trout then feed is astonishing. I recollect once fishing for roach in some still water, into which a small brook fell. It was crossed by a foot-bridge, only a few inches above the water. The May-flies were out in thousands, and under the bridge a veteran trout was lying in wait for them as they floated down the stream. Seeing its voracity, I recommended a young friend who was with me to place a natural fly on his

hook and try for it. He did so, but without success. After a long trial, disgusted at his failure, he gave it up, first, however, attempting to poke the fish with the end of his rod. The trout of course disappeared, but in the course of a few minutes resumed its station and fed as eagerly as ever. I now tried my turn, but with no better fortune, and sympathising, as it were, with the disgust of my young companion, finished by poking at the fish also with the end of my rod. In less than five minutes the trout reappeared, and, as it was evidently a large one, I determined to make another attempt. Accordingly, I wound up my line until three or four inches only of the casting line came beyond the rod, put on a natural May-fly, and let it drop under the bridge. My fly was only one among many that were incessantly dropping into the water, so it attracted no notice at first. After three or four dips, however, its turn came; it was snapped at, and the fish, feeling itself hooked, turned rapidly down towards the deep still water. It was making for a bank of thick weeds, into which it was my policy that it should not enter. So I held on, and called on my companion to bring a landing-net. He was amusing himself hard by with catching cray-fish, but came instantly at my summons, though he somewhat discomfited me by exclaiming that the net was too small to hold it. 'Never mind,' I cried; 'it must not go into the weeds. Shovel it in!' He did so, and threw upon the bank a trout weighing three pounds and a half.

An amusing anecdote was told me the other day

by a friend, which also goes to show how indifferent trout sometimes are to any but one particular fly.

'Going one day,' he said, 'on a visit to the house of a friend in Wales, the lady of the house said to me, after luncheon, "I have a dinner-party to-day, and want you, who are a fisherman, to catch me a dish of trout." There was a noble river hard by, and the day was to all appearance excellent for fly-fishing. Nothing loath, I set to work. I tried the rough water and the smooth, the deep and the shallow, but not a rise did I get. I changed my flies and tried again; not a fish would stir. I was about to give it up in despair, when I became aware of a gawky country boy, who stood behind watching me. "Have you tried under that rock?" he said at last. "Yes, I have tried everywhere, but the fish won't rise to-day."

'"Would you mind letting me try?"

'"With all my heart."

'"And you won't tell Squire —— that you saw me fishing?"

'"Of course I won't."

'The bumpkin went to the river's bank, caught a fly, made what I thought a wretchedly clumsy imitation of it, took from his pocket a tangled string, which he first tied to a long stick cut from the river's bank, and then set to work. In half an hour he had drawn out seven trout, not one of them under a pound, from the very pool that he had pointed out to me under the rock. I gave the scoundrel a shilling, took my basket of fish up to the house, and no

one knows to this day that they were not of my killing.'

Sometimes trout will not rise at any kind of fly. A worm is then a killing bait. A young friend told me to-day only, that he was recently fishing in a stream which runs through his father's park. He dropped his worm into a hole, and it was immediately seized; but the fish broke away, and carried the hook with it. Next day he dropped a worm into the same hole, and the hook was a second time carried off. On the third day he did the same thing, but with stronger tackle, and pulled out a trout weighing three pounds and a half, with all three hooks in its mouth.

One would have thought that after two such disappointments the fish would have eschewed worms as its diet for at least some time to come; but in reality a fish that is hooked by the cartilage of the mouth is more terrified than pained. I have more than once, when fishing at sea, seen a fish caught by two lines. It had taken the bait on one hook, and before it was pulled up had endeavoured to devour another, and so had been doubly caught.

## THE GIANT'S CAUSEWAY.

*August 24th.*

A bright morning, but a strong wind, amounting to half a gale, from the NW. Bad weather for enjoying the Causeway; for, though the contrast between the brilliant white breakers and the dark basaltic pillars was very fine, one had to keep up a perpetual struggle with the wind. Quiet strolling was impossible. I noticed to-day what I have often remarked before, that when a strong wind blows against the face of a steep cliff there is always to be found, a few paces in from the edge of the precipice, a region of comparative calm. The explanation seems to be this. The air driven violently against the face of the rock is checked and compelled to ascend; so that anyone standing on the extreme verge will encounter a strong wind, blowing upwards. A few feet up, this current, meeting with the direct blast, is bent downwards, and produces an eddy beneath, which, composed as it is of several conflicting currents acting in different directions, is equivalent to a comparative calm. Thus the traveller who has his wits about him may pursue his journey through a kind of tunnel, having towards the sea one side of an arch of wind, ascending and bending inwards; on the land side a current of descending air, which in the conflict has lost much of its power,

and produces a sort of lull. In order to discover if this theory were correct I threw up several pieces of paper. In every case they were drifted about irregularly at first, but in a direction towards the verge of the cliff, or against the prevailing wind. Not one was blown over, but, as soon as it reached the edge, was driven violently upwards, describing an arc of a circle over my head, returning nearly to the spot from which it was sent, and then repeating a similar evolution again and again until it was caught and held fast by the herbage. At the head of a sloping gully or ravine, on the contrary, the current took the direction of the slope, and blew with such violence that it was impossible to cross it without staggering to leeward; once or twice I was even obliged to stop, in order to make good my footing.

*August 27th*, 1861.

I lay for a long time to-day on the thick herbage which crowns the splendid cliffs called the Gobbins, in Island Magee, Antrim, amusing myself by watching through a telescope the proceedings of some Gannets, or Solan Geese. This bird, which is allied to the Pelicans rather than the Geese, is of a large size, much bigger than a Gull, from which it may also be distinguished at a distance by its greater length of neck, the intense whiteness of its plumage, and the black tip of its wide-spreading wings. But apart from all these distinguishing characters, its mode of fishing is by itself sufficient to mark it. In flight it is eminently wandering; it circles round and

round, or describes again and again a figure of eight at a varying elevation above the water in quest of Herrings, Pilchards, or other fish whose habit is to swim near the surface. When it has discovered a prey it suddenly arrests its flight, probably closes its wings, and descends head foremost with a force sufficient to make a *jet d'eau* visible two or three miles off, and to carry it many feet downwards. When successful, it brings its prize to the surface, and devours it without troubling itself about mastication. If unsuccessful, it rises immediately, and resumes its hunting. It is sometimes seen swimming, perhaps to rest itself, for I did not observe that it ever dived on those occasions. My companion told me that the fishermen on the coast of Ireland say that, if this bird be chased by a boat when seen swimming, it becomes so terrified as to be unable to rise. The real reason may be that it is gorged with food. He was once, he told me, in a boat on the Lough, when a Gannet being seen a long way off, it was determined to give chase, and ascertain whether the statement was true. As its the boat drew near, the Gannet endeavoured to escape by swimming, but made no attempt to use wings. After a pretty long chase the bowman secured it, in spite of a very severe bite which it inflicted on his hand, and carried it home in triumph. It did not appear to have received any injury, and, when released on the evening of the same day, swam out to sea with great composure. A fisherman in Islay told me that in some parts of Scotland a singular method of catching these birds is adopted. A Herring

is fastened to a board, and sunk a few feet deep in the sea. The sharp eye of the Gannet detects its prey, and the bird, first raising itself to an elevation which experience has taught it to be sufficient to carry it down to the requisite depth, pounces on the fish, and in the effort penetrates the board to which it is attached. Being thus held fast by the beak, and unable to extricate itself, it is drowned. Frequently, too, Gannets are caught in the herring nets at various depths below the surface. Diving after the fish, they become entangled in the nets, and are thus captured in a trap not intended for them. They perform good service to fishermen, by indicating at a great distance the exact position of the shoals of fish.

A method of catching Herrings off the Gobbins was explained to me, of which I had never heard before. It is known by the name of 'jigging,' and is practised as follows. At the season when Herrings are abundant on the coast, boats proceed to a certain spot which they are known to frequent, the crew of each furnished with long lines weighted at the end. At intervals of a few feet, a piece of light whalebone is secured by the middle, like the beam of a balance, and to either extremity is attached a short line and a hook, the latter having tied to it a piece of white feather. It is only for about an hour twice a day, at sunrise and sunset, that this method is adopted. The boatmen then throw over an anchor, and let down the lines till the weight is near the bottom. The hooks, which are at various depths, are then

'jigged' up and down continuously; the Herrings, attracted by the moving white feathers, come thickly round, and are caught, not by the mouth, but by various parts of their bodies. By this method large captures are often made without any expenditure of bait, and without risking nets.

# CLOVELLY.

*September 2nd,* 1862.

Returned home after a few weeks' stay at Clovelly. Clovelly is a fishing village on the north coast of Devonshire, much visited by tourists in summer on account of its peculiar and picturesque situation. The general character of the neighbouring country inland is tame and uninteresting, dreary without grandeur; hilly, but unrelieved by any eminences of commanding elevation. The pedestrian from Bideford, the nearest town, having completed between eight and nine miles of wearisome walking, with little to attract his attention but the ferny and flowery hedges—in which, owing to the humid character of the atmosphere, spring blossoms linger on far into summer, summer flowers bloom a second time in autumn, and, owing to the mildness of the climate, autumn flowers wait about for the arrival of the buds of spring—may pass through the wicket gate of a carriage drive on his right; when, if he is not footsore and therefore unwilling to lengthen his walk by a few steps, he will at once change the scene.

From this point a gently sloping road winds along the brow of a cliff so thickly wooded that at intervals only is the sea visible. The wall of rock on one

side, formed by the excavation of the road, is thickly clothed with luxuriant ferns and mosses, and the steep declivity on the other side is covered to the very verge of the cliff with a profusion of ferns, wood-rushes, meadow-sweet, and such other plants as flourish in a damp climate and beneath the shade of trees.

From two or three points of view, where trees have seemingly been cleared away for the sake of the prospect they concealed, the sea may be seen in its breadth coming close up to the edge of the thicket beneath. Here and there a stream, scarcely large enough in summer to make itself visible through the ferns which fringe its course, has worked for itself in the lapse of ages a deep channel with a high shelving bank on either side; and in one of those ravines or 'combes' is built the fishing village of Clovelly, a 'cataract' of houses, the topmost of which is perhaps 200 feet above the level of the sea, the lowest a few yards only above high-water mark. A high pier protected on the western side by a sea-wall curves eastward and makes a small but safe harbour for the trawlers and herring-boats of the villagers.

There are two ways of descending to the pier; one by the street, if street that may be called which is made up of two irregular lines of houses so located that the door step of one may be on a level with the upper windows, the roof, or even the chimneys of the next. The footway is a steep descent with numerous steps at unequal distances roughly hewed,

so as to require great caution in going down, and not a little expenditure of breath in climbing up. The other is a winding road practicable to carts, but more frequently traversed by donkeys.

Further to the west the same character of wooded cliffs continues for a mile or two. Beyond rises 'Gallantry Bower,' a steep brake-clad hill, the land side of which slopes down to a beautiful convergence of wooded valleys, and terminates seawards in a steep precipice of about 300 feet. Another hill succeeds, of less elevation but wooded to the summit; and from several points on this are fine views of Gallantry Bower and Barnstaple Bay to the eastward, and of strangely distorted cliffs, affording ample food for speculation to the geologist, stretching westward in the direction of Hartland Point. On the horizon rests Lundy Island, a grey, blue, or purple bank, according to the condition of the atmosphere; Gallantry Bower, and the wooded eminence called 'the Wilderness' adjoining it, are enclosed within the deer park of 'the Court,' through which with gentle declivity winds a road to Mouth Mill, the only place for many miles in either direction where the land slopes gradually to the sea-level.

Here are a lime-kiln and mill, from which last the cove derives its name. A towering rock, pierced by two irregular tunnels, accessible when the tide is out, but insulated at high water, called 'the Black Church,' is a favourite study to painters and a useful landmark to fishermen. Starting from hence before low water at spring tides we can return to Clovelly

under cliff, but by a difficult route. Rocks, fragments of cliff, and boulders occupy the whole distance between the sea and the base of the cliff, and there are but few places where the face of the precipice can be scaled. Patches of pebbly beach are rare, and only at low water is sand visible; though where the boulders cease sand begins and stretches outward to an undefined distance.

On such a coast as this the ordinary amusements of watering-places are of necessity wanting. No archery, no donkey-racing, no bathing-machines, no miniature castles or aqueducts, no chasing of waves, no perambulators, no German bands, and none of Punch's 'Common Objects of the Seashore.' The algologist can find few seaweeds on so rugged a coast: the conchologist will soon finish his labours.

One point in the history of shellfish I did indeed settle to my own satisfaction — that the Limpet is not of necessity confined to the same spot during all its life.

I was one morning, at low water, picking my way among the rocks and little pools at Mouth Mill, when I saw a limpet attached to a piece of smooth seaweed (*Laminaria*) which the tide had left hanging over a rock. There are two common species of Limpet (*Patella lævis* and *P. pellucida*) which habitually infest this seaweed, the latter adhering to the flat frond, the former eating out a cavity at the base of the stalk; but this was the common rock Limpet, which is preeminently the species considered by Lamarck 'to live habitually in the same place, and

to execute no other movement than that of slightly lifting its shell to allow water to reach its branchiæ or breathing apparatus.' Knowing that the seaweed was not its usual place of abode, I watched it closely for about a quarter of an hour, during which time it glided, with a motion like that of a snail, from the seaweed to the rock, and continued its motion till it had completed a journey of about three inches. All the while that it was progressing, the shell was slightly raised, and it was feeling about with its two awl-shaped tentacles, just as a man walking in the dark feels the way with his feet. It advanced equally well over smooth rock and small sea-acorns; and happening to come in contact with another Limpet, turned as if to avoid it. It does not, I think, necessarily follow from the fact of this individual Limpet having been observed in motion that Limpets are nomad in their habits. This particular one may have been removed from its place by a blow, or have originally settled itself in a cranny too narrow to admit of continued growth: or Limpets may perform migrations at certain periods of their lives, remaining for a long time at each station. It is certain that they do frequently remain attached to the same place long enough to allow their shell, equally with the surrounding rock, to be infested with minute algæ, the spot actually covered by the animal remaining bare; and on every shore specimens may be observed, the margin of whose shell exactly fills up the crevices and depressions of the rock to which they are attached, the shell having

actually *grown into* the irregularities beneath. Were such a Limpet to shift his quarters he would be unsafe on a smooth surface, liable to be attacked by Crabs and other prowlers, and he might travel a long while before he found another rock the surface of which tallied exactly with the irregularities in the margin of his shell. If, too, I recollect rightly, I have seen, on limestone, Limpets which have actually hollowed out for themselves depressions in the rock exactly corresponding in size and shape with their own shells.

Permanent residents by the sea-side have opportunity enough of verifying this fact if they think it worth while. An easy method would be to scratch on a rock with a sharp instrument a circular line round a certain number of Limpets, and to observe at their next visit, what proportion of them had crossed the line, and what amount of progress they had made.

Knowing beforehand the character of the coast which I was about to visit, I had contemplated finding my amusement for the most part in boating and fishing; or, if the weather should prove too stormy for going to sea, in hunting up the various species of stalk-eyed crustaceous animals (that is, Crabs and Shrimps) which inhabit the coast. Little preparation is needed to pursue this amusement. Study I cannot call it; for all that I proposed to myself was to compare whatever specimens I might find with the descriptions given in Mr. Bell's excellent manual, and, having ascertained their names, to read what is known of their habits.

A bag-net, attached to a strong iron hoop about 18 inches in diameter, and fastened to a stout pole, was all my apparatus.

The tides being at the spring, I began my search at low water among the boulders on the shore. My first capture was a young and minute Crab,* about the size of a fourpenny-piece, which earns its livelihood by hunting for food beneath stones on the sea-shore. In this respect it agrees in its habits with most of its congeners. Protected by a hard shell, as the Crabs are, from the attacks of the smaller sea marauders, they are utterly powerless against fish big enough to swallow them whole. Their only chance of safety therefore lies in keeping to shallow water, where the larger fish cannot pursue them, or in creeping about in the interstices of rocks, under stones, and in little pools. Most fish will take a small Crab as a bait, and it is consequently a necessary preliminary to line fishing, on some parts of the coast where no other bait can be obtained, to repair to the shore at low water and collect Crabs for bait. These, if very small, are put on the hook entire; or, if larger, are broken, and the soft substance within is tied to the hook by a thread of worsted. On some parts of the coast of Cornwall where large Spider Crabs are numerous, the crabbers who find no market for 'Spiders,' as they call them, nevertheless take them from the crab-pots and keep them for this purpose.

* *Xantho rivulosa.*

There is no possibility of ascertaining to what extent Crabs constitute the food of fishes; but, as the majority of fish are caught near the bottom, it is a fair inference that there they feed, in which case the creeping things of the sea may form a large proportion of their diet.

In the shallow pools and among the stones at low-water mark I captured numerous specimens of a small Shrimp,* which, but for its attempts to jump after I had secured it in the net, I should scarcely have detected, so exactly did the specimens resemble in colour the sea-weeds among which they swam. Some wore the colours of *Enteromorpha* and *Ulva*, being of a bright green; others wore the purple of *Porphyria*; others the olive brown of *Fucus*; and one, caught on a sandy bottom, was the exact colour of the sand over which it swam. Novice as I was, I thought, at first, that each colour characterised a separate species, but a brief examination showed that they were exactly alike in structure and configuration. The speckled one, at first, I thought to be a common Shrimp,† but this too proved to be identical with the others. The Algæ which I have named above grew in every pool in which I caught specimens of the Shrimp, and I concluded that each individual Shrimp infested the plant which it resembled in colour; but whether green Shrimps ever shift their quarters to purple weeds and change their colour accordingly, or whether each retains its own

* *Hippolyte varians.* † *Crangon spinosus.*

colour and habitat during the whole of its existence, is a question which experiment only can solve. I saw here, however, another of the many striking instances of the providential care bestowed on the preservation of a species from extinction. One would be inclined to pronounce, without reflection, that a bright green or bright purple Shrimp would be a more conspicuous object of prey than a grey one; but where two prevailing colours of the vegetation are green and purple, the chance of detection by an enemy is infinitely diminished.

Anglers are well aware that a parallel variation of colour is observable in Trout, which, in a stream flowing over a light soil, are tinged on the back with a similar colour; but, if the bed of the stream be dark, their colour deepens so as to approach the same shade. I have even seen light-coloured fish taken from a gravelly river, and from a tributary stream close by Trout of the same size, the colour of whose backs was exactly that of the dark olive moss* which clothed its bed.

A plunge of the net into a larger pool, the sides of which were clothed with the common olive-brown sea-weeds, produced a fine Prawn,† which was followed by several others. The boys on this coast catch a great many Prawns in a primitive but very effective way. Peering about the little pools near low-water mark, they discover the long antennæ projecting from among the seaweed, and, seizing

* *Fontinalis squamosa.* † *Palæmon serratus.*

them with the fingers of one hand, give a gentle pull. The faintly resisting Prawn is compelled to accept the invitation, and without using his formidable rostrum, is captured with the other hand. The systematic method adopted here is more artistic. At low-water spring tides, a man goes into the water and walks along the sand, outside the boulders, dragging behind him an oblong iron frame, or dredge, to which is attached a deep bag-net. As this collects all substances too large to pass through the meshes, it soon becomes heavy; when, being brought to shore, the contents are emptied into a basket and culled over by a partner, assisted or impeded, as the case may be, by all the idle boys on the beach. The first operation is to clear the basket of seaweeds, which are mostly the delicate kinds that grow in shallow water and have been washed in by the action of the waves. This process is conducted with much caution; for every haul produces one or more 'Sting-bulls,' a name here given to the 'Lesser Weevor,'* a small fish about three inches long, furnished on the back with a black fin armed with acute spines, which the animal has the power of elevating at pleasure, and with which it inflicts an exquisitely painful wound, causing not merely local pain and swelling, but producing inflammation, which rapidly extends up the whole arm and renders it powerless. It is tenacious of life, and, if thrown on the wet sand, remains motionless; but, if touched

* *Trachinus Vipera.*

ever so lightly, wriggles with a convulsive movement; when, woe to the naked foot or ungloved finger that it touches! I once witnessed the effect on a young friend who attempted to lay hold of one. He was pricked in the thumb, and described the local pain as resembling the sting of a wasp, but far more acute; and that which extended up the arm as an intense aching, which lasted for several hours.

A yet more formidable fish to look at is the Lasher,* or 'Father Lasher,' which also comes to shore in the prawn net. The fishermen on this coast seem to include it under the same name as the Weevor, and are equally afraid of it. It resembles the river fish called 'Miller's Thumb,'† having a large thorny head; but the spines are not movable, and do not readily inflict a wound, as I have often handled them without any perceptible effect.

The seaweeds and Sting-bulls being disposed of, there now remains in the basket the spoil proper, that is to say, Prawns, a few large Shrimps, ‡ and perhaps half a dozen sorts of small fish, which latter the children claim and carry off as their booty.

A Pipe-fish no one cares to have. This is a thin cylindrical fish, about 12 inches long, of nearly equal diameter throughout, with a blunt head and finless tail, which, but for its moving, might easily be taken for a fragment of Sea-tangs; § whence the fishermen call it the 'Ore-weed fish.' But the other fish are

* *Cottus bubalis.*
† *Cottus Gobio.*
‡ *Crangon spinosus.*
§ *Chorda filum.*

carried off with great glee. I observed among them, besides the useless ones above mentioned, a Rockling, a Pollack, a Sole, and several Poutings.

The result of two hours' wading was about two hundred large Prawns, worth five shillings; little enough when one considers that two men were occupied, one in fishing, the other in sorting the capture; and that, except in tolerably calm weather and during the hours before and after low water, at spring tide, the prawning net remains unemployed.

I had no hesitation in referring the Prawns captured here to the *Palæmon serratus* of Bell and other authors, though nearly all the specimens differed from the normal type of the species in having the serratures of the rostrum, both above and beneath, double, each tooth being accompanied by another smaller and less robust one. This character I found even more strongly marked in small specimens which, on another occasion, I caught in little pools at Mouth-Mill.

The boys on the beach seeing that I was interested in Crabs, brought me a fine specimen of the Velvet Swimming-Crab;* so called from being covered with down, and from having the hinder pair of its legs flat and broad, so as to be well adapted for swimming. 'The colours of this fine species are exceedingly bright and shiny,' says Mr. Bell, and so I found them to be, the prevailing tints being rich brownish red and bright blue, the eyes crimson. It was found under a

* *Portunus puber.*

*Prawning, at Clovelly.*

large stone, and when thrown on the sand, elevated its nippers and showed fight whenever approached.*

On other occasions I found on the shore numerous specimens of the common Shore Crab,† especially in the harbour, to which they doubtless resorted for the sake of the offal thrown over by the fishermen when cleaning their fish. These are the small Crabs so abundant on most parts of the coast, which boys delight to catch with a fish's head tied to a string and thrown into the water. The Crabs, prowling about for what they can find, fall in with the bait and begin to feed; the fisherman gently pulls in the string with the bait attached, and the victims, not being able to distinguish between this movement and that caused by the wash of the sea, hold on until actually drawn out of the water and captured. The claws of this species are very sharp, and are used not only in progression, but to clasp their prey. So tightly do they hold, that on one occasion, having caught a pretty large one in my shrimping-net, and proceeded to take it out for close inspection, the poor creature clung so tightly to the meshes that the upper part of the carapace or shell came off in my hand, leaving the body and legs behind. These crabs never attain a large size, and are consequently not prized as food, but they nevertheless afford sweet and delicate eating.

In similar situations with these, I found several specimens of the Common Crab of the market.† Some of these were under two inches in length, but,

* *Carcinus Mœnas.* † *Cancer Pagurus.*

even when of this small size, they were easily distinguished by having the front margin of the shell divided on each side of the antennæ into ten nearly square lobes. Crabs of this species, when sufficiently grown to be protected from injury by a hardened shell, live in deep water; but in their early stage their habits seem to be the same as those of the smaller kinds described above. They resort also to holes in rocks, whence they are often extracted at low water by boys and men, armed with a stout stick to which is fastened an iron hook.

My last capture among the Stalk-eyed Crustaceans was the common Hermit Crab,* a species which having only the front portion of its body encased in a shell cleverly inserts its unprotected tail into the empty abode of a Periwinkle or Whelk, which thenceforth becomes its castle and den. When so disposed it withdraws itself entirely within its stronghold and fills up the aperture with its projecting claws and nippers, a perfect protection against the prying nose of any fish small enough to peep in, while its rear-guard might serve as a model for a 'Merrimac' or 'Warrior.' When going abroad to dine it protrudes its nippers and front legs studded with bosses and spikes, and crawls nimbly along, bearing its shelter with it. At times, nevertheless, it is liable to danger. As it grows it fills the shell with its nether extremity, and feeling cramped after an abundant meal is warned that a dwelling a size larger is desirable; so pinched by repletion and not by hunger, it looks about for lodging number two. If it meets one that

* *Pagurus Bernhardus.*

will fit, it at once enters into occupation, but if unsuccessful in finding an empty house, it is by no means scrupulous in evicting the first ill-starred tenant in possession whom it may encounter. Unsuspected,—for is it not a Whelk externally?—it mingles with the herd of Whelks, who, superior to itself in size, feel no alarm; and taking an accurate measure with its stalked eyes of its neighbour's proportions, makes a selection, garottes, strangles, and drowns without mercy, and having thus disposed of the tenant, takes possession of the tenement; the perilous part of the enterprise being the shifting of its nether parts out of the old pantaloon into the new.

But with all his atrocities the Hermit Crab is a funny little fellow. He may be met with in most places where Periwinkles and Whelks abound, but may be looked for, with certainty of success, in little pools between the rocks.

The weather being calm during the greater part of my stay at Clovelly, I frequently went on the water, much to the satisfaction of my three young companions, of whom one was very fond of rowing, another was anxious to get specimens of sea birds, and the third was a keen fisherman. The staple fishery of Clovelly depends on Herrings; but of these none had been seen as yet. Many schulls of Mackerel had, however, been observed in the bay; and drift boats went out every evening in quest of them, with no great success, however. Mackerel, like Herrings, are surface fish, and sometimes congregate in count-

less numbers. They are vagrant in their habits, appearing suddenly in some one or other of their favourite haunts, and capricious in their stay. They make their presence known to the fishermen by rising in a body to the surface, which, still advancing, they agitate by the frantic movement of their fins and tails, till a rippled appearance is produced like that caused by lashing hail, or handfuls of coarse gravel flung from a height. Suddenly the agitation ceases, but quickly reappears at some little distance. They are now, perhaps, darting forward at great speed, flinging themselves out of the water, gleaming in the sun like burnished silver, and driving before them a rippling wave. One would suppose that on these occasions they were endeavouring to escape from the monsters of the deep beneath; and such may be the case. At any rate, when Mackerel are off the coast, large fish of other kinds are also abundant, and a bit of Mackerel is an excellent bait for other fish.

The mode of fishing for Mackerel, principally pursued by amateurs, is that called 'whiffing.' When the boat is either under sail or impelled by oars, a line lightly weighted is thrown over, having for bait a strip of Gurnard, or Mackerel-skin, a white fly, or any bright substance which when rapidly drawn through the water simulates a small fish. We generally threw out our whiffing lines as we cruised about, but were never favoured with a single bite. The reason of our failure was, according to the fishermen, that Mackerel never take a bait 'when 'the schulls are breaking up.' The expression sounds

scholastic, and might mean that my young friends must not hope to catch Mackerel in the holidays; but it was explained to mean that when the fish rise and play about on the surface, they are not in a feeding mood.

The instrument of capture employed by the fishermen is the drift net. This is a long and narrow net, furnished with leads at one edge, and buoyed up with corks at the other. It is thrown overboard in the evening, so as to hang in the water across the tide; one end being left free, the other attached to a boat. All drift on together quietly, and if a schull of Mackerel come across the net, a greater or less number is entangled in the meshes. At varying intervals the net is hauled in, and, the fish being first taken out, thrown over again. This process is repeated until daylight, when the boats return with their capture. There was no great catch whilst I was at Clovelly; the largest was, I believe, seven or eight hundred; while, on many occasions, some boatmen toiled all night and caught less than a dozen. Of the Mackerel taken many are useless, owing to their being mangled by Dog-fish, Hakes, and other large fish which prey on them when entangled in the net. It is no consolation to the fishermen that these sea-robbers often pay the penalty of their evil doings with their lives, for they seriously damage the nets in their efforts to escape.

On two occasions I saw a Shark lying on the beach. One was the species known as the Porbeagle, a malicious-looking monster about six feet long, with

a mouth armed with three rows of very sharp triangular teeth. With some little difficulty, I cut out the lower jaw of this, and had it boiled till the teeth came out. Before the time when the use of metal was familiar, one of these teeth might have served for the head of a light arrow. The other was a Fox-shark, a much less common species. This was about five feet long, and was remarkable for the structure and length of its tail, the upper lobe of which exactly equalled in length the remainder of the body, and in shape and size resembled a scythe; while the lower lobe bore a rather less proportion to the body than is usual in fishes. As to the question, 'What may be the use of such a member?' Mr. Couch says, 'it is not uncommon for a Thresher (or Fox Shark) to approach a herd of Dolphins that may be sporting in unsuspicious security, and by one splash of its tail in the water put them all to flight like so many hares before a hound.'*

The reader is intended to infer from this, that the Fox Shark's tail is an instrument of offence; and this opinion is confirmed by a narrative, also quoted by Yarrell,† of a battle between several Fox Sharks and some Swordfish on the one hand, and a Whale on the other. 'As soon as the Whale's back appeared above the water, the Threshers, springing several yards into the air, descended with great violence upon the object of their rancour, and inflicted upon him the most severe slaps with their long tails, the

* Yarrell's *British Fishes*, vol. ii. p. 380.

† Ibid. vol. i. 144.

sound of which resembled the report of muskets fired at a distance. The Swordfish in their turn, attacked the distressed Whale, stabbing from below; and thus beset on all sides and wounded, when the poor creature appeared, the water around him was dyed with blood.'

The captor of the specimen brought in to Clovelly had seen only one previously, but the number of other kinds caught in the nets must be considerable, as the fishermen look on *nets damaged by Sharks* as an ordinary item in their account of 'wear and tear.'

Porpoises or 'Herring-hogs,' as they are called on this coast, are of frequent occurrence. We saw one or more nearly every time we went to sea; and on one occasion a herd passed within a gunshot of the pier-head. It rarely happens that these animals are caught in the nets. Like wasps in spiders' webs, they break through, or wallow on carrying a portion with them. Poor fishermen! Life is to them a lottery indeed; yet they set an example of cheerful content, which would sit gracefully on many a tiller of the soil (who, I believe, would grumble at all weathers unless he could choose his own, and a different one for each of his crops); while, for generosity and neighbourly good-will, they are distinguished above any class of men I have ever met.

Stranger as I was, and not lavish of money, I expected but little consideration among them; but whenever it happened, as it several times did, that I came down on the pier at low water without having

announced my intention of going to sea, and my boat was high and dry on the beach, a word from my boatman commanded at once the services of Tom, Bill, George, and half a dozen others. All lent their ready and strong hands with a will; and my boat, which on the first occasion I thought too heavy to be moved, was afloat in no time. And this without hope of fee or reward, though every one of them probably would have been glad to earn the few shillings which my boatman was to receive for his labour.

With one instance of 'brotherly love' I was especially pleased. A great many schulls of Mackerel had been seen one afternoon, but the wind was from an awkward point of the compass, and a squally night was expected. The fishermen had determined not to put out to sea that evening, with the exception of one, who, having a boat, nerve, and will all equally strong, determined not to miss the best chance the season had yet afforded. His partner, for there are always two to a boat, did not like the look of the weather, and recommended staying at home. The other persisted, and said he would go by himself; and so he did. Thereupon the aforesaid Tom, Bill, and George talked the matter over with half a dozen others, and it was agreed that they 'did not like the thoughts of ——'s being all night out by himself.' Accordingly, two other boats, each with its complement of two men, put out to sea; and, honest fellows that they were, though —— proved to be man enough to take care of himself, so that their helping-hand was

not required, they made the best catches of Mackerel that had been brought ashore for the season.

I too was a gainer by their kindly act, for next day the sea was down again, and as I wanted to go a fishing, they supplied me with a few Mackerel for bait.

On this occasion, and several others, we either rowed or sailed about two miles to the westward, and when we had taken our marks let down our grapnel, which brought us to. The lines were then thrown over, each being made of stout cord, near the lower end of which was fastened a 1 lb. leaden weight; just above this a bit of stick, a few inches long, was secured in such a way as to keep the remaining portion of the line, called the 'snood' and made of fine cord and copper wire, clear of the upper portion; the actual fastening of the hook was wire, but even this we often found insufficient, as it was on many occasions snapped by some large fish as if it had been mere thread. I once tried strong treble gut, which, after it had brought up several small fish, parted with a single tug from some unknown monster. Another kind of line, which we found more effectual, was similarly weighted, but below the weight there was suspended by the middle a short and slender rod of iron, called a 'spreader,' having a wired hook hanging from each extremity. Our bait was Mackerel if we could get it, or, in default, Skad or 'Horse-Mackerel.'* This is a coarse kind of fish, something like Mackerel in form,

* *Caranx trachurus.*

size, and habits, which has the advantage, when used as a bait, of being tougher than most other kinds of fish, and so is not liable to be nibbled away by small fish.

Having sounded with the lead, we drew up the line so far as to have the bait all but touching the bottom, and waited for a bite. This was rarely long in coming. Sometimes we should fish for half an hour and catch nothing but Dog-fish, ugly shark-like creatures, with large heads, lanky bodies, and rough skins, some white below and dirty grey above, with a sharp spine an inch long behind the dorsal fin: 'Pick Dogs'* (that is, spiked Dog-fish) they are here called, greatly dreaded by fishermen on account of the severe wound which they can inflict with their spike. Others, 'Spotted Dogs,'† were less numerous than the Pick Dogs, which they closely resemble, but are speckled with black over the upper parts and are destitute of a spike. They are neither of them eaten on this coast; though in Cornwall they are commonly salted when other fish are scarce; and in my estimation are not to be despised. Those which we caught were killed by beating their heads against the boat, and carried in to be used as bait by the Lobster-catchers. We had been told that the way to attract Gulls round the boat was to throw overboard the liver of 'a Dog,' a lure which no Gull can resist. We tried the experiment several times with perfect success. The offal was flung into the water,

* *Spinax acanthias.* † *Scyllium canicula.*

and one of our party imitated the shriek of a Gull, when, in most instances, the dainty birds came round us in numbers. The prevailing species was the Kittiwake,* here called 'Heckleck,' and with them were associated a few Herring Gulls† and Black-backed Gulls.‡ We shot specimens of every kind that we saw, and proved that they were not attracted by hunger alone: since, when wounded, they disgorged a mass of partially digested 'Brett' or Herring fry. One, which was shot directly overhead, dropped on the gunwale of the boat, and spattered us with fishy pulp.

We generally found that whenever 'Dogs' took our bait, we caught little else. The boldness with which these fish feed is surprising. When one was hooked and hauled up, it was frequently followed to within a few feet of the surface by several others, jealous it would seem of their ensnared comrade, who had swam off with the prize which they had been striving for; and when the captured fish was lifted into the boat they sulkily retired. More than once, when a line was drawn up without having a fish attached to it, a Dog followed the ascending bait, and was seen to take the hook when the fisherman held the lead in his hand, and two or three instances occurred in which Dogs were caught by two hooks at once, having taken first the bait of one line and then of another; clearly proving,

* *Larus tridactylus.* † *Larus argentatus.*
‡ *Larus marinus.*

that, whatever amount of pain is inflicted by a hook, it is not sufficient to damp their appetite.

Whenever we fell in with a set of Sharks of this description, we speedily shifted our ground, perhaps to fare no better elsewhere; but we never failed to find eventually a spot where something was to be had worth catching. Our capture consisted mainly of Bream,* weighing from one pound to three; with these was a sprinkling of Pollack,† Gurnards,‡ Skad,§ and Conger.‖ Finding that our bait was sometimes nibbled away and few fish caught, we supplied ourselves with a stock of smaller hooks. On the first occasion of trying these, we were lucky enough to fall in with a vast quantity of small Whiting Pouting,¶ which we pulled in to our hearts' content. Together with them we caught the usual number of Bream; so that the bottom of our boat was soon well covered. Strange to say, a party in a boat anchored not far from us did not take a single Pouting. Either we were particularly fortunate in anchoring over a rock which was a favourite resort of these fish, or, what is more probable, our neighbours were fishing with too large hooks. We did not take the trouble to count how many dozen we had brought in, but there were enough to supply our breakfast table for many days. These fish, either eaten fresh or sprinkled with salt, are not inferior to Whiting: the fishermen consider them better.

* *Pagellus centrodontus.*
† *Merlangus Pollachius.*
‡ *Trigla Gurnardus.*
§ *Caranx trachurus.*
‖ *Conger vulgaris.*
¶ *Morrhua lusca.*

For the study of ornithology Clovelly is not favourably situated, there being neither mud-banks nor sands for sea-birds to repair to. Of marine birds we saw nine species only. These were Kittiwake Gulls—the prevailing species, which occupies the same place here that the common Gull does elsewhere, the Herring Gull, the Black-backed Gull, the Cormorant,* the Teal,† the Guillemot,‡ the Shearwater,§ and the Gannet.‖ Of the last we saw several small parties of three or four, some full-grown birds snowy-white with black tips to their wings, and some in the dingy plumage of the first year. I watched them for a long while wheeling in circles and figures of eight over the sea, evidently on the look-out for fish; but on no occasion did I observe one pounce on its prey, as I have seen them on other occasions. Probably they did not find their fishing-ground sufficiently productive to tempt them to make a long stay, for they remained a few days only.

On shore I had an opportunity of identifying the Cornish Chough,¶ or Red-legged Crow, to my entire satisfaction. Walking one evening in 'the Wilderness' I came near to the edge of the cliff, and looking over I saw a party of four perched on a rock not thirty feet distant. They were not at first aware of my vicinity and gave me full time to distinguish the red colour of their feet and bills.

* *Phalacrocorax carbo.*
† *Anas Crecca.*
‡ *Uria Troile.*
§ *Puffinus Anglorum.*
‖ *Sula alba.*
¶ *Fregilus Graculus.*

After having once observed them so near at hand, watched the movement of their wings, and heard their cry, I had no difficulty in discriminating between them and Jackdaws on other parts of the cliff; and I have now no doubt that on many former occasions, when I have seen birds on the coast which I believed to be Choughs, I was right in my conjecture. One of my companions was very anxious to obtain a specimen for his museum; but though he would have had no difficulty in bringing down four at a shot on the occasion referred to above when no one had a gun, we could never again get within shot of them.

The Lobster fishery of Clovelly is monopolised by one boat with a crew of two men who have stood by one another as partners for seven years. Long may the partnership last; and may Lobsters annually become more abundant, especially among the rocks between Clovelly pier and Hartland Point, the hunting-ground of the sturdy, weather-beaten, kind-hearted pair, in whose boat I spent most pleasantly the last week-day of my sojourn at Clovelly.

It is not likely that many of my readers have had both the opportunity and inclination to pass a day in a lobstering-boat. Should such a coincidence present itself, I would advise them to devote to the pastime the first day that 'George' and 'James,' as I shall call my boatmen, recommend as being favourable for the trip being taken by an amateur. Let the visitor of the day then dress himself in an old suit of clothes inured to stains of sundry kinds. Let him provide

himself with bread and cheese enough for three, a bottle of beer for himself, a bottle of porter for George, and a small flask of spirit, with which he may perhaps prevail on James, a water-drinker, to temper his insipid beverage. Let him take a note-book and pencil, to make memoranda of what he sees and hears. I unfortunately forgot these last articles, and had to trust to my memory aided by a few words scratched with a penknife on my powder flask. Let him take a gun and swan shot or a rifle: and let him not be squeamish, or he had better stay at home. He must prepare himself for a sitting of six hours in a small boat. During a part of the time he will be under sail, but for a still longer time oars will be used. He must not be timid if taken nearer to rocks and breakers than he would like to venture if he were alone. His stomach must not easily be unsettled; as he will be subjected to the 'short uneasy motion' of sidelong progress through the trough of a ground swell. The cutting up of raw fish, less fresh than a rose, is not a specific for nausea; nor is the essential odour of a lobster-boat a restorative to patients complaining of faintness. He must not mind a wetting in case it should turn out a rainy day: for he starts with the understanding that he cannot be set on shore till the day's work is done; and if the wind should set in strong from the east, he must be prepared to take an occasional short spell at the oar. James and George are indeed well up to their work, but what has happened may happen again. They may find themselves dead beat by the

necessity of pulling half a mile an hour for seven miles, against a squall from the eastward; in which case, though wholly innocent of any intention of giving in, they will be thankful for the trifling rest which even the substitute of a landsman's puny arm can afford them.

Two hours before low water we embark, and as soon as we are well clear of the pier head hoist sail. The sea is almost calm; there is positively no ripple, only a sluggish heaving of the boat, the effect of tide rather than of wind. The sail has nothing to do, and amuses itself by flapping against the mast and trying to jib. We seem to be stationary, but on looking for the pier head we find it some way astern, and casting our eyes on the rocks ashore, we see that we are clearly making way, dropping down in fact with the tide to westward, but so slowly that the sail is lowered and oars are thrown out.

Our object is to make direct for Hartland Point, the extremity of the fishing-ground, and to work homewards.

Pipes are lighted and we prepare for a quiet chat. Being desirous of ascertaining whether our boatmen appreciate 'the picturesque,' we angle for a sentiment and get an immediate rise.

'Yes, the cliffs are beautiful *now*; but, if you want to see them in their perfection, you should come with us very early—before sunrise—some morning when the sea is quite calm. The reflection of the cliffs in the water is then a splendid sight; and if you look down into the water you can see

*great leaves of divers colours* waving;—Oh, it *is* beautiful!'

Various rocks and coves are pointed out in succession, each with a name, and a reason why the name was given.

Between the 'Great' and 'Little Gazelle Rocks' a cutter was drifted, and went to pieces before she could be got off.

In 'Sarah Cove,' a vessel bearing the name thus perpetuated was stranded, and nothing recovered but a brass blunderbuss; and so on. To one charming cove the name of 'Hook's Harbour' was given by the present James and George, in honour of Hook the painter, with whom it is a favourite corner.

Mr. Hook, it seems—as his pictures might have informed us—is an agreeable, affable gentleman, who is fond of going to sea in this very boat, and knows all about lobstering, and drifting, and trawling; and who paints boats, sails, oars, nets, lines, fish, lobster pots, Lobsters and Oysters, so true to life, that no fisherman in Clovelly can find a flaw in his work. James and George could either of them draw up a *catalogue raisonné* of his Clovelly pictures. They saw them all while they were in progress, and perhaps offered friendly criticisms as valuable to the artist as if they could write A.R.A. after their names. They are familiar with the very drapery of 'Stand clear!' and in 'Luff, boy!' know the name and lineage of the child at the helm, whose wonderfully anxious and wistful face so eloquently expresses

eagerness to do his father's bidding, mixed with a shadowy doubt whether the 'Luff, boy!' lesson is being duly rehearsed.

A cliff is now pointed out where the Greater Black-backed Gull, here called the 'Black-winged Gull,' annually builds. A young bird was once taken from this nest by a Clovelly cliffsman, and reared to be in a small way the pest of the village. His fearless audacity is described as being most remarkable. Of children he was an indefatigable tormentor, pecking their heels and terrifying them out of their wits: but his favourite amusement was to seize women's petticoats and hold on with all his might. He did not mind being kicked a few yards; but returned undaunted to the charge. As to appetite, 'What he would swallow!' Not only fish and offal disappeared in no time, but food also of a kind for which he could not have inherited the taste from his progenitors. Slowworms were considered a tit bit: on a certain occasion two chickens had fallen into a barrel of tar and been smothered; these he swallowed whole, tar and all, and another meal was made off five drowned kittens.

Seals are occasionally seen on the coast, one having been observed only a few days since. Of these animals the following incidents were narrated to me.

'Some years ago we were passing this spot, between the lights, when I saw something on the low rocks yonder which I could not make out. I stopped and examined it closely, and called out, "It is a Seal!"

We took the boat in, and a Seal it was, a monstrous big fellow, holding a great Hake across his mouth. As we came near he shuffled into the water, and I aimed at him with my oar. I am doubtful whether I hit him or not, but I knocked the Hake out of his mouth, and a fine one it was. Another time I was on board a boat in the bay. I had been asleep in the cuddy all night, and in the grey of the morning I came upon deck and looked over the side of the boat, when I saw, close alongside, the figure as it were of a man standing right up out of the water, looking at me full in the face. It did not move or seem afraid of me; but I was so frightened that I thought I should have dropped. I crept quietly down and called my mate. Up he comes, bringing a big stone that we had on board for ballast. The seal was there still; so he lifted the stone with both his hands over his head, and flung it down on its head. We knew that the creature's skull must have been cracked, by the noise the blow made; but down it went, and we saw no more of it.

'Seals sometimes come to the drift nets when there are Herrings in them, lay hold of the fish with their mouths, and fling them up into the air as if in sport. Gulls, it seems, consider this game intended for their benefit, as they throng round and appropriate the spoil.'

Lobsters are neither so numerous now nor so large as they formerly were. The fishermen are of opinion that these creatures reside for the most part in deep water, and pay periodical visits to the rocks in shallow

water, where they are caught; they think, too, that these visits are made, to a certain extent methodically, by the large and small in distinct parties. This opinion they found on the fact, that if they catch a Lobster or two at a particular spot to-day none are to be had to-morrow. They argue from this that if Lobsters crawled to and fro on the coast, they would be caught without intermission on the same rock; but if they migrate inwards and outwards without wandering far to the right or left, they are to be caught by lying in wait for them in a line parallel with the coast and at different points in that line successively. The fishermen state, moreover, that all the Lobsters which they catch on any given day are nearly of the same size: so that, if the first captured be a small one, they expect to catch small ones only on that day; but if it be large, they have reason to expect a batch of large ones.

The American shore, I was told, was 'the place for lobsters.'

'I was once coasting there, and, one day, made the best lobster-pot I could out of an iron hoop and a piece of net. I had nothing to do but to let it down and haul up again, and though there was nothing to prevent their getting out, I caught as many as we wanted — and of such a size! I have seen the "biter" of one, large enough to hold five half-pints by measure.' These biters are formidable weapons, as they will inflict a severe wound; not so bad, however, as that inflicted by a Crab's biter. The latter animal bites with gravity, and holds on

tenaciously. The more you pull, the tighter he pinches; and you must either sever the tendon or crack the shell to make him let go. The Lobster bites with a snap, and if the substance he has fastened on be held up, he will open his biter and drop off. But the wound inflicted by either is too serious to be trifled with; and, strange to say, neither of the boatmen could recollect having been bitten more than once, though they have been handling shellfish for years.

Sting-bulls sometimes get into the pots, and though inferior in size, are far more formidable. 'I was in a coasting vessel once, at anchor off the Mumbles in South Wales, and observed a great many Pollock inside some rocks. So I took the boat and went to catch some. I had caught pretty many, and laid hold of what I thought was one, but I soon let it go, for it stung me so that I was obliged to roar out for pain. I got back to the ship and turned into my hammock, and there I lay writhing and groaning with agony till the tide turned, and then, you know, the burning died out and I grew easier.'*

With narratives of this kind the time was pleasantly whiled away until we reached Hartland Point, a fine headland prolonged into the sea by a reef of rocks, some sunken, others appearing at low water above the surface. Over or between these the tide sets with such velocity, that it is known by the name 'Race of Hartland.' Our boat was brought up within what I should have considered a dangerous

* This was probably the Greater Weever, *Trachinus draco*.

proximity to this seething cauldron — for such it resembled — but that I had entire confidence in my skilful boatmen. A dead 'Dog' was cleansed, and the offal thrown into the water, and presently the boat was surrounded by innumerable Kittiwakes attracted from their station on the rocks by the sight of their favourite morsel, perhaps taught by experience to associate the appearance of a boat in this unusual place with floating offal.

A large flock of Gulls, I was told, habitually station themselves on one of the headlands which we had passed, and wait until they see the Basse * springing above the surface. They then take wing, not in pursuit of these fish, which are too large for them, but to make common cause with them in the pursuit of Brett. The latter, pursued by Basse, rise to the surface in the effort to escape. Thither the Basse follow them, and in the eagerness of the chase frequently fling themselves out of the water—a signal this to the Gulls that prey is within their reach also.

Basse are generally caught here by whiffing with a fly. The pursuit seems to require some amount of skill, as one man in the village is especially distinguished as being successful in this fishery when no one else can catch any. We passed near several shoals of them to-day, and I twice made trial of my skill as a marksman by shooting at one as it rose; but with what success I shall leave the reader to conjecture.

* *Labrax lupus.*

The first lobster-pot was now hauled, and was found to contain one Lobster of moderate size, which was secured, the stale bait was thrown away and fresh Dog-fish substituted. The boat's head was then turned homewards, and the pot thrown overboard at some little distance from its former place.

There are two kinds of lobster-pot in common use, both after the type of that sort of mousetrap which allows the mouse to enter through a circular hole, which is contracted inward so as to prevent his return. Of these, one is cylindrical in form, the frame being of wood and the walls of net; the other is a low dome of wicker-work, with a circular hole at the top: the latter kind, which is considered the best, is the only one employed here. It is weighted with stones, and the bait is fastened by wooden skewers to the inside, in such a way that it cannot be got at without entering the trap. To it is attached a rope about eight fathoms in length, having corks fastened on at intervals of a fathom. It is generally sunk in about four fathoms' water, so that a portion of it always remains floating. One inconvenience connected with this method is, that on portions of the coast where there is much traffic the corks are liable to catch in the bottom of ships, and to be carried off, pot and all.

'I recollect one evening going in to Falmouth in a brig, and we could not conceive why we made so little way; but we discovered next morning that we had run foul of a string of corks, and carried off a crab-pot that had become entangled in another

and another. I don't know how many we had taken in tow altogether. We did not know their owners, so, as we could not return them, we quietly cast them off and said nothing about it.'

The ropes are interesting to the algologist, as confirming the truth of the statement, that certain kinds of seaweed grow only in shallow water, where they are well within the influence of light. Thus the portion of every rope which floated was thickly invested with delicate tufts of *Ceramium*, *Polysiphonia*, *Cladophora*, &c. On that portion of the rope which was but slightly submersed the specimens were smaller and less numerous, while the part which was always in deep water bore no trace of vegetation. Were it possible for anyone to examine the weeds clothing the bottom of the sea on the shelving coast, from low-water mark down to deep water, he would in all probability find the same plants gradually dwindling away in the same ratio, and finally disappearing.

The ropes do not seem to be injured by the parasitic growth; the pots are entirely free. The latter, through decomposition and the wear and tear of hauling, are worthless at the end of a single season.

We now proceeded on our way homewards, examining and removing the pots as we proceeded. The tide was still running to the westward; but close along shore, where alone the fishery is conducted, there runs an eddy tide, of which the boatmen avail themselves, in order to diminish their labour. We

had consequently taken advantage of the direct tide to reach Hartland Point, and were now profiting by the eddy, in order to return.

While the hauling of the pots is proceeding, one man takes the oars, the other stands up and looks out for a string of corks, the position of which he has a wonderful facility in remembering. He catches at any portion of the cord which he can reach with a gaff (a large hook fastened to a stout stick), and at once begins to pull in. When the pot has reached the surface it is lifted on to the gunwale of the boat, and the capture, if there be any, taken out with the hand. The Lobster makes no resistance, and seems to have no power of aiming at anything with its biters. Suddenly removed from a dense to a rare medium, most likely it cannot see distinctly. When placed in the bottom of the boat it frequently flaps its tail several times, and so makes a slight retrograde movement, but in a short time it is scarcely more lively than it is as seen on a fishmonger's stall.

The colour is a dark beautiful blue, varied with light blue and whitish.

'We caught one once,' I was told, 'of a beautiful sky-blue. A gentleman was out with us, and he begged us to keep it for a friend of his, who would send for it. He did not send, but came down to Clovelly himself to fetch it, and gave us five shillings for it.'

Our way took us through the 'Canal.' This is a long narrow passage between two low rocks, which

recalled to my mind what I had read of coral reefs. They are nearly equal in height, sloped like the glacis of a fortification seawards, and scarped towards the land. The surrounding rocks are grandly picturesque. The whole scene, in fact, was so striking, that I asked the boatmen whether no artist had been out with them for the purpose of sketching them. I found that the task would not be an easy one, as the rocks can only be approached when the sea is calm, and must be left at a certain period of the tide.

We examined, as well as I can recollect, three or four dozen pots, from which we obtained about twenty Lobsters, all of about the same size as the first, a large Crab, and a Velvet Crab. I was desirous of obtaining a specimen of a Swimming Crab* for a friend, though I thought it improbable that they descend in quest of food so low as the lobster-pots. They are well known to the boatmen, who told me that none had been seen this year. They occur generally during the Herring fishery, and are found in the nets some seasons 'in hundreds and thousands;' they feed on the Herrings, and, when meddled with incautiously, bite hard.

Towards four o'clock we found ourselves again near Clovelly Pier, off which are moored large store pots, of the same form and material as the others, to which the daily catch is transferred, to await the period of sale. A few Lobsters only are consumed in

* *Polybius Henslowii.*

the village and neighbourhood, the majority being purchased at a set rate by the 'jowders,' fish salesmen, who carry off in carts all the saleable fish that are brought on shore, and retail them in the neighbouring towns.

Their visits being periodical, it is often necessary to keep the Lobsters for several days, and to keep them alive, too, or they become unsaleable. They are accordingly sunk in the stone pots: but to prevent them from damaging one another with their biters, it is necessary to render these powerless. One method of doing this is, by pegging them with wood at the final joint—a barbarous custom now obsolete; another is by tying the nippers with string, an unsafe plan, for the string may slip, in which case the biter being released is tolerably sure to do great execution among its fellow-prisoners.

Our present friends once tried that plan, and lost two or three dozen Lobsters in a single night, all mutilated or killed, and having themselves no power of standing on the defensive. The third plan is to sever, with the point of a knife, the tendon which works the biter. The weapon is thus paralysed, and no mischief results from stowing them away in a common prison.

This operation I did not care to witness, and, at the expiration of six hours from the time of going on board, was set on shore to stretch my legs by climbing up Clovelly-street.

*Ferns.*

The north of Devon has supplied many of the new varieties of Ferns which, during some few years past, have been so extensively cultivated by collectors. Though all of these are curious and interesting, and some beautiful, I do not myself consider a fernery composed of these monstrosities so enjoyable, in a picturesque point of view, as a rockery planted with fine specimens of Ferns exhibiting the normal character of the species; and the rockery itself would be far more beautiful, because natural, if the constructor, instead of endeavouring to combine in one a fernery and a museum of spars and other minerals, would take care to employ massive stones only, all of the same geological formation, and to arrange them all so as to have the same dip, if stratified rocks; or, if amorphous, in such a way that the general effect should resemble that of the country from which they were brought.

The wanderer through the Clovelly woods will find many a nook which if he could reproduce in his garden with its garniture of ferns, mosses, and liverworts, he would have a gem indeed. One bank especially, on the way to Mouth Mill, can scarcely fail to attract his admiration. The predominant Fern here is the Hay Fern (*Lastrea Fœnisecii* or *L. recurva*), an elegant species as a solitary plant and under any circumstances, but particularly so when grouped in dense masses of luxuriant growth, and contrasted, as it here is, with stately Male Ferns and

delicate Lady Ferns. A similar grouping together of many specimens of the same kind of Fern, whether common or not, would materially tend to produce a semblance of nature in a made fernery. Look where you will in a wood, some one species of Fern is pretty sure to predominate to such an extent as to give a feature to the landscape. Ferns, like Wild Hyacinths and Wood Anemones, are social plants, commingling, indeed, with each other, but nevertheless having centres of radiation, where they are found, not in greater abundance only, but in more exuberant growth.

Fern growers who have not the means of drawing on such woods as those of Devonshire for their supplies, and who do not approve of the easy but somewhat tedious process of raising Ferns from seed, may be glad to know that a certain and speedy method of propagating both the common species and rare varieties is practicable at an easy cost of time and expense. Let a frond of any kind of Fern be separated with a penknife from the rhizoma, or root-stock, and, when shortened to the length of an inch or two, be plunged into silver sand, in a damp shady atmosphere, under glass, and with a moderate amount of bottom-heat. Each stalk will soon send out roots and buds, and a new plant will be produced in a short space of time. This discovery was made by the late Mr. Jackson, of Barnstaple, but is not as yet generally known.

*Sloughing of Crabs and Lobsters.*

It is well known that Crabs and Lobsters periodically cast their shells, and various observers have recorded instances in which the process has taken place under their own notice. The most complete account that I can find of the sloughing of its shell by a member of this family, is contained in the fourth volume of the *Journal of the Proceedings of the Linnæan Society.*

The subject was a Lobster which was kept in a large salt-water aquarium in the Museum at Scarborough along with other marine animals and a quantity of common seaweeds. For two days the Lobster had been observed to be busily occupied in detaching all the soft seaweed it could collect, and carrying it to one end of the aquarium; at the same time clearing a considerable space at the other end of the tank. While thus employed it carried itself in a peculiar attitude, with the tail elevated and forming nearly a line with the abdomen, which was straight and seemingly rigid.

On the third day a transverse crack was observed reaching across the back, between the head and body. When this had opened to about the width of half an inch, the bright blue membrane of the new shell was plainly visible in the interstice. The animal then set up a strong vibratory action of the body from side to side. The first segment of the body, being coaxed forwards by this movement, pushed itself through the slit; when the animal, satisfied

with the progress it had made, remained at rest for a short period. It then began to wriggle again, and continued to vibrate until the second segment was released, when a second interval of repose followed; and so on till the whole of what is popularly called 'the tail' of the Lobster rose, segment by segment, through the slit, assuming an arched form. The tail then slipped back over the shell, on which it rested, retaining its natural form, but destitute of all protection except a blue membrane, the whole presenting the appearance of a Lobster with one head, but with two tails placed one over the other.

It was now observed that the carapace, or covering of the head, had split up from the aperture already described to the point of the beak, in such a way that the two slits together resembled in shape an inverted T. The hinder pair of legs then drew themselves out of their boots, and the animal rested. The next then followed, and so on until all the walking legs were released and withdrawn without any apparent exertion. The pressure of the animal widened the T; and through the opening the anterior portion of the animal issued, mouth, beak, antennæ, and even eyes, all perfect, leaving their counterparts unaltered in form. The biters still remained encased, and were not extricated without a violent effort. This consisted of two powerful and sudden tugs, to which force was imparted by the animal straining with the under part of its body against the upper part of the shell outside.

On examining the biters, or 'hands,' as they are

termed, of a Lobster, one would suppose that they could not be withdrawn from their case without some additional fissure of the shell. But such was not the case; as the dilated soft parts were forcibly drawn through the narrow joints, during which process they were subjected to a pressure which had the effect of making them longer and more slender. With the last tug the regenerate Lobster plunged backwards, and left its coat of mail split across the back indeed and up the carapace, but, with these exceptions, sound and perfect.

The whole operation occupied about twenty minutes, and was performed in that part of the tank which the Lobster had cleared from weeds.

Immediately after emerging from the shell the Lobster was much deformed; there was a general elongation of the whole animal, especially the biters. During the few subsequent hours, both the body and claws became shorter and much larger, being distended, as it appeared, by water imbibed through the surface of the skin or soft shell. At first it was shy and inactive, remaining in retirement among the collected weeds; but in a few hours it emerged from its retreat and moved freely about the tank. The membrane of the new shell, which was bright blue, remained soft for some days, but on the seventh it appeared to have become perfectly hard.

It is possible that the blue Lobster caught by the Clovelly fisherman may have owed the brightness of his colours to the newness of his clothes.

The writer of the interesting paper from which the

foregoing account is condensed, afterwards dredged a Common Shore-crab* in the act of casting its shell. In this case the carapace was entire, and the animal was preparing to emerge by lifting the lid, on a hinge, so to say, and crawling out of its own skin. When taken, the animal had nearly effected its escape, and had already imbibed through its new membranous shell enough water to distend it to four times the bulk of the shell in which it had been encased only a few minutes before.

It would appear, then, from these instances, that the hard shell of crustaceans does not grow, but that at intervals, the animal being compressed by its case, emerges in the way described above, and immediately expands, the new shell taking the dimensions of the animal enclosed.

The correctness of this view is confirmed by the testimony of a young friend who has frequently seen both Shore and Velvet Crabs slough their shells in an aquarium. He describes the process as being performed without apparent exertion or difficulty. The carapace cracks nearly all round under the margin, when the animal lifts it like the lid of a box, and scrambles out, leaving its deserted tenement standing in the same posture which it occupied when the 'flitting' was commenced. The whole operation usually lasts from ten to fifteen minutes; but more instances than one have fallen under his notice, in which a Crab about to moult walked about in his aquarium with the carapace detached at the edge,

* *Carcinus Mænas.*

and loosened from the body. He had observed also the increased size of the animal immediately after leaving its shell. The Hermit Crab, he tells me, sloughs its carapace only, and in one unmutilated piece. He has now in his aquarium a Hermit Crab, inhabiting a large Whelk shell, which he has kept ever since it was of a size to be lodged conveniently in the shell of a common shore Periwinkle.

The usual seasons of moulting are autumn and early spring. The observations on the Lobster in the Museum at Scarborough are dated July, 1857.

### *Natural History of the Ancients.*

Turning over the pages of an old copy of *Aldrovandus de animalibus insectis*, printed at Frankfort, in 1623, I was much struck with the contrast between works on natural history of even that comparatively recent date and modern treatises on the same subject. The former, written in crabbed Latin, intelligible to scholars alone, contain little matter which is either instructive or entertaining; the latter, professedly imperfect, consist of accurate descriptions and verified facts only, and may be depended on as safe guides to the student; at the same time that they offer to the professor a solid groundwork for the record of future discoveries.

What would a student in natural history think of a handbook to his favourite branch of science which contained a description of the Scorpion such as the following greatly condensed epitome of Aldrovandus, the first naturalist who devoted a special volume to the subject of entomology?

The whole article extends over ten folio pages, but the few facts recorded are either so entangled in a maze of errors as to be inextricable, or so distorted as to be incredible.

'Besides the *insect* called "Scorpion," Aristotle describes a venomous fish under the same or a similar name. Of this Pliny writes that it has on its head so many prickles that it cannot be safely handled unless caught hold of by the tail or by the middle of the body with two fingers only.*

'Another name (of African origin) for the Scorpion is "Nepa," which is also a distinctive title of one of the signs of the Zodiac. The Scorpion was raised to its dignified position in the heavens for the following reason: Orion, when hunting, ventured to boast that he was able to kill all animals which had their origin from the earth. The earth resenting this vaunt, produced an enormous Scorpion, which attacked the hunter, and endeavoured to destroy him. Jupiter admiring the courage of both combatants, placed the Scorpion among the constellations; whereupon Diana, the patroness of Orion, begged Jupiter to grant to her champion the same favour he had conferred on the earth, by receiving Orion also into heaven. The request was complied with, and it was arranged that, to keep the rivals apart, when the Scorpion rose, Orion should set.

'The name "Scorpion" was also given to a curved lock of hair, tapering to a point, worn on the forehead by the beaux and belles of antiquity. Another

* This is probably the Weever. See p. 181.

kind of Scorpion was an engine of war, employed in throwing stones, as some say, or poisoned arrows, according to others. The same name was given also to a whip, of which the lashes were armed at the extremity with hooks,* for mangling the flesh of criminals.'

Our author gives two derivations of the word, both from the Greek, *σκαιῶς ἕρπειν*, to 'crawl obliquely,' and *σκορπίζειν*, 'to scatter,' because it discharges venom from its sting.

According to Ælian, 'there are nine kinds of Scorpion, the white, red, dusky, black, green, ventricose, crablike (of a flame-colour, the most venomous of all), the winged (which has a double sting), and the seven-jointed. Nicander makes eight species only.' Other authors are then cited who describe additional species, of which some are two cubits in length, others no bigger than a bean, others which afford an excellent oil for curing the wounds inflicted by their own stings, others so venomous that their sting proves fatal even to swine — animals proof against most poisons. Black pigs, it seems, are soonest affected, especially if in their agony they take to the water. Scorpions in some countries are more deadly than in others, the virulence being most intense in the hottest regions. The Scorpions of the district of Trent are singularly harmless. Persons stung by them feel no pain—a privilege preserved for them by the prayers of a certain holy bishop, Vigilius by name, their patron

* See 1 Kings xii. 11.

and intercessor. Switzerland produces a small kind of a wine-red colour, thence called *Vinulæ*; these are scarce and harmless.

The animal itself is next described as 'somewhat egg-shaped, furnished with eight legs, an oblong tail composed of numerous joints, of which the last is longer and stouter than the rest and bears a single or double hollow sting. The head is inconspicuous and resembles that of a Crab. Besides the eight legs it has two biters like those of the Crayfish. With these it holds fast whatever object it has clasped, until it has inflicted a sting.' A reason is then given why the sting of the Scorpion is exserted, while that of winged insects is included within the body; and the argument is stated whether the sting is perforated for the transmission of poison, or whether the venomous effect is produced by a spiritual or slightly humid emanation from the weapon. Galen, we are informed, is in favour of the latter theory. Tertullian, in the introduction to his treatise against the Gnostics, expresses a contrary opinion. It did not, however, occur to either author to decide the question one way or the other by dissecting a specimen. The various countries are then enumerated which Scorpions are known to inhabit. 'In Africa and India they are numerous and exceedingly venomous. Adjoining the Locust-eating Ethiopians is a district once fertile and thickly populated, but long ago deserted by its inhabitants, who could not make head against the multitudes of Spiders and Scorpions which infested it.

The same calamity befell also the country adjacent to the Lake Anatha in India. In Egypt Scorpions are very large, and so venomous that their sting causes instant death. The natives stand in great dread of them, and have invented no less than six hundred devices for protecting themselves. Southern Lybia produces two kinds, of which one crawls on the ground, the other is winged. About Susæ, in Persia, they are so dangerous, that whenever a royal progress is about to be made, orders are given two days before to wage war on the deadly reptiles, which conceal themselves under stones and turfs, &c.'

A chapter is next devoted to their 'Character and disposition;' and here, two great authorities are at variance. Pliny states that the female Scorpion drowns all her offspring save one, as soon as they are born; the exceptional one, the cleverest of the family, climbs on his mother's back, and stations himself in a position where he is out of reach both of her mouth and sting. Aristotle, on the contrary, states that young Scorpions, immediately on their birth, attack their parent and destroy her. These unamiable nursery performances ended, Scorpions become unobtrusive; they avoid the heat of the sun and seek shady places, where they lie harmless unless trod on or otherwise provoked. Ælian, however, reports differently of their character. Scorpions, he says, are naturally artful, and the inhabitants of Lybia, holding them in great dread on account of their vast numbers, employ various precautions against them. They elevate their beds on lofty

bedsteads, which they place at a distance from the wall, the supports being made to stand in pans of water; and here they sleep, wearing their stockings. In spite of these precautions, if a Scorpion can discover anything in the ceiling from which it can suspend itself, it takes a firm hold of the projection with its biters, letting its sting drop; a second Scorpion then climbs down, creeping along the first, and clings to it in the same attitude; to the second clings a third; to the third a fourth, and so on until the chain is sufficiently long. The lowest in the chain then stings the sleeper, and climbs up over the bodies of his supporters; the next follows the example of the last, and so on until all have withdrawn, each crawling over the bodies of those above itself. The truth of this statement is confirmed by Clemens Alexandrinus, who adds, that if a Scorpion does not succeed in reaching a man whom it wishes to sting, it goes away and fetches others, conveying its meaning not by signs and attitudes, but by a language of its own. From this artful and malicious nature of the Scorpion originated the proverb quoted by Sophocles, 'A Scorpion lies in wait under every stone.'

The food of Scorpions is variously stated to consist of earth, the rejectamenta on the sea-shore, creeping things, and flies. Like serpents and other venomous creatures, they can endure long abstinence from food.

The venom of Scorpions varies in intensity according to the species, climate, and time of day

when the wound is inflicted. The effects resemble those produced by the bite of a serpent, but the sufferings of the person bitten are more terrible, and are protracted over three days. To young women, and indeed to women generally, the sting invariably proves fatal, and to men also if they happen to be stung in the morning, before the venom has been diminished by any chance encounter with another object. The symptoms are as follows:—The wounded part immediately becomes inflamed, hard, red, and painful. The patient is in turns hot and cold; lassitude creeps over him; he perspires freely and shivers; his hair stands on end, a pricking as of needles is felt over all the body; a rash appears on his skin; the face is distorted; he foams at the mouth; vomiting, sobbing, and convulsions follow. In short, there is urgent need for active remedies. The first of these is to enlarge the wound and to apply drawing poultices to eliminate the poison. This done, antidotes to poison should be taken, either general or specific. These, fortunately, are very numerous, and are to be found, some simple, some compound, first, among plants, that is herbs, shrubs, and trees; secondly, among animals, either with blood or bloodless; and thirdly, among minerals. Of plants no less than a hundred are recommended as specifics, which are to be administered in various ways; Southernwood or Wormwood, for example, steeped in wine, is to be taken inwardly; garlic and rue mixed with oil are to be laid on the wound. The herb Attractilis possesses such virtue that it stops the pain of the sting if only

held in the hand, but ceases to operate immediately that it is laid down. The seed-vessels of Marsh Marigold, which in shape resemble the sting of a Scorpion, are efficacious: Wild Cummin is useful because its seeds are similarly formed, and the herb Telyphon, the root of which is like the tail of a Scorpion, is not only a specific against the sting, but instantly deprives of life the animal itself if only touched by it. To prevent Scorpions from climbing into beds, it is recommended that the feet of the bed should be encircled with Paliurus or filberts. The milk of an unripe fig dropped into the wound is a good remedy. Jovianus Pontianus records an instance of a man dangerously stung being cured by swallowing frankincense on which was stamped the figure of a Scorpion. In order that this last remedy should be effective, it is necessary that the figure should have been engraved on the stone of a ring at the time when the constellation Scorpio is in the ascendant, and the moon in the same sign; the frankincense, moreover, must have been stamped with the seal under the same combination of the heavenly bodies.

Among animal remedies, by far the most convenient is human saliva; so simple, indeed, and easy to be obtained, that one wonders why it was thought necessary to prescribe any other. All that one has to do is to mutter a charm and spit three times on a Scorpion, when it instantly falls dead: but the spoken charm is not indispensable, provided that the operator be either hungry or thirsty; otherwise the application acts more or less slowly, in proportion

to the quantity of food recently taken. The following applications to a wound are considered efficacious: the brains of a hen, the skin of a he-goat, the flesh of a mouse, frog, or lizard. River Cray-fishes pounded in a mortar along with ass's milk, are infallible as a potion. If ass's milk cannot be procured, goat's milk will answer the purpose. Lastly, if the Scorpion which inflicted the sting be caught, mashed to a paste and laid on the wound, it is a certain cure, or, if preferred, it may be roasted and eaten.

Of minerals, sulphur, salt, the sapphire, agate, &c., possess much virtue. Galen recommends the application to the wound of the stone on which the wounded person happened at the time to be standing.

All the above remedies are classed as 'simple,' but the list includes also 'occult remedies,' among which the following are inserted with propriety. If a man stung by a Scorpion sit on an ass with his face towards the animal's tail, he will be cured, and the pain will be transferred to the ass. A variation of this remedy is given. If a man stung by a Scorpion immediately walk up to an ass and whisper into its ear, 'A Scorpion has stung me,' he will at once be relieved of his pain; but the ass, feeling the effect of the wound, will soon die.

Of compound remedies, the best is one prescribed by Galen, who employed it when he lived in Africa, not to cure only those who had been stung, but as a preventive. It contains flowers of sulphur, stone sulphur, frankincense, eleven kinds of herbs, and

deer's brains: all to be reduced to a powder, and taken, a spoonful at a time, in wine.

Our author proceeds to give, in seven closely-printed pages, extracts from numerous writers, in which we are informed that some Scorpions are generated from the excessive heat of the sun, some from crabs, and some from crocodiles.

Then comes a repetition of several methods of driving them away. Plants and animals are enumerated which take their names from the Scorpion. Antipathies, augury, analogy between Scorpions and demons or heretics, hieroglyphics, emblems, epigrams, coins, fables, proverbs, and use in medicine, are the subjects of as many chapters. The last contains a receipt for the composition of oil of Scorpions, which, though curious, is too long to give in full. In the beginning of May, oil must be taken a hundred years old, and placed in a glass vessel. In it must be infused fresh St. John's-wort, and the whole must be exposed to the sun for ten or twelve days. For three days more the infusion must stand in a water-bath. Then the oil must be expressed, and other specified herbs infused, and the same process must be repeated again and again, until the dog-days begin, when three hundred live Scorpions must be placed on hot embers until they emit moisture. They are then to be covered with the oil previously prepared, and allowed to soak for three days. The fluid subsequently strained off, and mixed with certain drugs, is veritable 'Oil of Scorpions,' a specific.

against the plague, wounds inflicted by venomous animals of all kinds, and a variety of diseases.

### *Antediluvian Toads.*

At intervals of a few years, an attempt is made to startle the wonder-loving portion of the public with an account of a Frog or Toad being found embedded in stone or coal. In these cases, because either no aperture at all had been observed in the stone, or none sufficiently large to admit a full-grown animal of the kind, the finders most logically conclude that none ever existed. The necessary consequence of this assertion is, that the stone or coal must have been deposited in a soft form round the patient animal, having caught him, perhaps, when he was enjoying his winter sleep. The possibility of this having taken place is denied by all naturalists and geologists; no man accustomed to deal with the facts of natural history will admit that 'a frog who swam in the water in which Adam bathed his stalwart limbs' could have lived even long enough to claim Noah as a contemporary; much less that it should have survived down to the nineteenth century, either in a situation ever so favourable to the prolongation of Batrachian life, or shut up in an hermetically-sealed stone box.

But it is argued, if a Frog or Toad is *found* so enclosed, how did it get there. The question is easily met by denying not merely the fact that such

an occurrence ever took place, but the possibility of *proving* such an occurrence by any amount of testimony that can be produced.

If a quarryman were shown a block of solid marble, and were told, 'In the centre of this mass a frog is embedded. Split the stone cleverly into two pieces and release it;' he might, supposing him to be a skilful workman, perform the task to the satisfaction of a refuted and convinced society of geologists and naturalists.

But such a finding of a Frog is simply impossible. The animal is never found until the stone is broken; and who can say that there existed no communication between the chamber and the outer air before the fracture was made? Neither quarrymen nor colliers are in the habit of examining minutely every mass that comes under their hammers; and even if a workman could swear positively that he had made a strict examination and *discovered* no orifice, it is as far as ever from being proved that there was none. Science admits no such negative proof as this.

Crowds of credulous admirers flocked, at the International Exhibition of 1862, to inspect the Frog which is said to have been found embedded in coal at the bottom of a deep mine, thereby sufficiently demonstrating their own credulity, indeed, but not the vivaciousness of the reptile.

Its history may be told in a few words. Some months before, a young Frog was crawling along the upper earth, and arrived at the shaft of a mine. Not

being gifted with the discretion of the Æsopian Frog, who, in time of drought, declined jumping into a well until his friend could inform him how he was to jump out, he leaped in, and being as yet not far removed from his tadpole state, fell lightly into a pool at the bottom of the mine. He did not find the water to his taste, so he swam ashore, and climbed among the shale till he found a hole, into which he crept, and where he remained until he had grown too large to get out, having fed daintily all the while on the various crawling things which abound wherever moisture is supplied. In due time he was discovered by a miner, and despatched to London as an antediluvian.

'But how are we to account,' the believer in living antediluvian Frogs may object, 'for the appearance of frogs in the rocky face of a perpendicular cliff? Frogs may *fall* to any depth, but *climbing* is beyond them, you must admit?'

Softly, if you please. Pray what is to prevent a Frog from climbing? Tree Frogs spend the summer portion of their lives among the branches of trees, and live on the insects which they find there, and they differ in no respect from the common Frog, except in having the extremity of their toes dilated into a viscid disk, which no doubt is of great service to them in climbing, but is by no means proved to be indispensable; and it so happens that three several instances have fallen within my own observation, of which two have proved, to my entire satisfaction, that Frogs can climb; one, that Toads can climb.

In the year 1852, I contributed the following paragraph to a periodical called 'The Naturalist:' *—

'I was sitting in my drawing-room, this very wet morning (Sept. 18, 1852), when I was called away from my book by the sudden exclamation from one of the children, "Here 's a Frog crawling up the window!" Strange as was the intelligence, it proved to be true. With legs and arms expanded on the wet glass, and adhering to it with all the under surface of the body, sprawled a half-grown Frog, motionless, but with sparkling eyes, and breathing naturally, as the rising and falling cheeks clearly proved. After resting a few minutes it began to stir, and with remarkable activity ascended several inches, moving its limbs exactly as a sailor does when climbing the shrouds. Again it became stationary, supporting itself, however, without effort, and soon after mounted another stage. A third movement, a sidelong one, brought it to the wooden frame of the glass, which it partially crossed, clinging to it with one hand, and adhering to the glass with the other hand, its throat, and chest—the legs hanging free. Its hold now was evidently not secure, and in about a minute it fell back upon the window-sill outside. Four feet below the window is an iron grating, placed over a pit, constructed to admit light into a cellar-window. In this pit a number of Frogs had taken refuge in the scorching weather of August, and here, I supposed, they were doomed to spend the rest of their lives; but this ambitious traveller must

* Number for January, 1853.

have taken advantage of the wet weather to climb four or five feet of rough masonry, four feet more of smooth painted wall, and about ten inches of polished glass. Is this climbing power of Frogs known, and may it not help to account for the strange situations in which the Batrachian tribe are sometimes found?'

In the year 1854, I contributed to another periodical, 'The Home Friend,' vol. v. p. 281, a description of a fine specimen of mignonette, which I had trained up to the proportions of a shrub in my conservatory. The article thus concludes:—

'During the last few days, a pet Frog, kept in the greenhouse to destroy insects, has chosen to station himself among the branches of this tree, about two feet from the ground, where, but for the brightness of his eyes, he might be taken for a withered leaf, as indeed he was when first discovered. He climbs probably to his cool and fragrant bower by the help of some bushy plants which grow beneath the mignonette and are entwined among its lower branches. Every evening he descends and travels about the greenhouse in quest of food, but generally returns in the morning to his favourite post; and it is with the children one of the amusements of the day to provide him with a worm, and to watch the almost electrical rapidity with which he darts at it, and, afterwards, the wry faces and snapping gapes which he employs to prevent his prey from escaping.'

These instances of a Frog climbing were recorded with no intention of proving a theory, and, conse-

quently, do not lie open to the suspicion of having been distorted or exaggerated to suit a particular purpose.

The third instance, which has not yet appeared in print, occurred a year or two afterwards, and led me for the first time to entertain the opinion, an opinion confirmed by the previous instances — That the English Batrachians, generally, possess the power of climbing, and exercise it whenever so disposed.

One morning in spring, a young friend who has a great taste for natural history begged me to come and see a thrush's nest which contained a full-grown toad. He took me to a tall quickset hedge which served as a partition between two of my meadows. With some difficulty I thrust aside the branches, which were very thick, and discovered the nest in question, about five feet above the bank on which the hedge grew; and in it there was, as he said, a large living toad, motionless, but having its bright eyes wide open, and apparently as much at its ease as if it were squatting under a moss bank on the ground. My friend visited it again and again on several consecutive days, but what became of it eventually I do not know. I ought, perhaps, to have disturbed it, in order to see whether eggs had been laid in the nest, and if so, whether the reptile had climbed up from any dishonest motive; but I did not molest it, and know only that it must have climbed up five feet to take possession of its retreat, and either have remained there several days or gone away periodically and returned.

From these facts it is clear that frogs and toads can climb, and their possession of this power affords, I think, a satisfactory explanation of their being found in holes in the sides of quarries. It is far from improbable that they live for a long time, some years perhaps, in a hole, the aperture of which is too small to allow a passage to a full-grown animal; but on the supposition that a toad crept into a hole when it was very small, there is no reason why insects smaller than itself should not crawl in by the same opening. Wild bees, moths, wasps and caterpillars are notoriously given to the exploration of such caverns, and once in the grim sentinel would effectually prevent their return.

With respect to the poor frog who was the centre of attraction to many a wondering multitude at the International Exhibition, no one, as far as I am aware, ventured to pronounce an opinion, even approximately, on the number of centuries which have elapsed since the formation of the coal which constituted his dreary prison. But, supposing him to have been enclosed while the enveloping substance was still in a plastic state—the only theory which can well be advanced—he must have attained a venerable age; yet, strange to say, he was not half-grown, owing, perhaps, to the surrounding pressure. One would have thought that after so long a confinement, I know not how many yards below the surface, where the temperature is somewhat high, and the choice of respiration lies between choke-damp and fire-damp, he would have been able to find vital air under any subsequent conditions, however unfavourable. Yet

tenderly as he was, no doubt, treated at the Exhibition, he could not stand being immersed in a bottle of water unprovided with weeds to keep it pure, and was carried away in a state of decomposition.

The newspapers of the period teemed with parallel instances, of which the most striking appeared in 'The Times.'

TO THE EDITOR OF THE TIMES.

Sir,—The controversy in your columns on the above subject, reminds me of what I heard when resident in Northumberland, as having occurred at Chillingham Castle, the seat of the Earl of Tankerville.

A slab of marble, forming one side of the chimneypiece, in either the dining-room or drawing-room, was observed to be always damp and somewhat discoloured; and partly from curiosity, and partly because the chimneypiece was injured in appearance at that part, it was determined to examine the place carefully. The slab was removed, and, I believe, was cut by a saw near the part where the unusual appearance existed, and a toad was discovered alive in the marble at this spot, and in the marble was found a recess of the size of the toad, and in which it exactly fitted.

I give you the story exactly as I heard it in the immediate neighbourhood of Chillingham Castle, and a single line from the Earl of Tankerville would confirm or disprove the above statement, as its truth or want of foundation must be perfectly well known to his Lordship and to those resident thereabouts.

If the story is substantially true, I suppose that it is not more astonishing that a toad should be found in coal than in marble. Your obedient servant,

GODFREY SINCLAIR.

Ormsary, Lochgilphead, North Britain:
*Sept.* 18, 1862.

Now, if the above 'is substantially true,' it is not at all 'astonishing that a toad should be found in *coal*;' inasmuch it is not beyond the bounds of possibility that a living toad should have crawled about among the land and freshwater plants to which coal owes its origin; but it is beyond all credibility that one could ever have existed among the unhardened constituents of marble. The skeleton of a frog discovered embedded in coal would be an interesting fact for geologists to expatiate on, but such a discovery in marble would shake the science to its foundation.

But no amount of evidence would entitle the story to credence, for it refutes itself. 'A slab of marble,' it is said, 'was observed to be always damp and discoloured.' This dampness, we are led to infer, proceeded from the body of the embedded toad. Toads, no doubt, are damp as long as they are alive and in a healthy condition; but, surely, their moisture is not self-derived. If the marble was always damp, there must have been a constant supply of the moisture as constantly carried off by evaporation, and from what source did the toad derive his supplies? Suppose him to have perspired but a drop a day, and to have been imprisoned since the time of Adam — moderate computations both — he must have given off from his radical moisture at least three hundredweight of water; for that he could have obtained it from without is denied by the supposed fact that he completely fitted his marble matrix.

It is not always the case that the fallacy of these stories is so patent as in the above instance; but if they were all thoroughly sifted there can be no doubt that an equally weak point in the evidence would be discovered.

While the above remarks were going through the press, another instance of longevity in toads has been recorded in the newspapers, as well authenticated as any of the previous ones, but nevertheless not proved to the satisfaction of those cautious people (and I frankly confess myself to be one of them), who, until convinced by positive evidence, decline to admit into the category of facts statements which contradict all past experience. The following letter appeared in 'The Times' of the 20th May, 1863:—

TO THE EDITOR OF THE TIMES.

Sir,—A short time ago you quoted a letter written by me to the editor of the 'Elgin Courier,' in which I mentioned the discovery of living toads, in making a railway cutting through rocks near Altyre.

As many of my friends have questioned the authenticity of the signature, will you allow me to avow myself to be the writer, and in confirmation of my statements to forward the enclosed extract from the 'Forres Gazette' of last week.

The ground under which these living toads are found consists of two feet of black soil, from six to twelve feet of water-worn gravel, and four to eight feet of hard sandstone, all resting upon a bed of red conglomerate.

While inspecting the railway works I have myself seen numbers of living toads taken out of the conglomerate at

depths of from fifteen feet to twenty-four feet from the surface. An extensive, and seemingly unbroken, bed of rock covers the stratum in which these living toads are found.

In sloping the sides of the cutting to one-and-a-half in one we may anticipate a further release of prisoners.

I shall be glad if any scientific person will account for the presence of living creatures in such a position.

I am your obedient servant,

ALEXANDER P. GORDON CUMMING.

7 Park Street:
*May* 18.

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'TOADS IN ROCK.—The 'Forres Gazette,' referring to a letter from Sir Alexander Gordon Cumming of Altyre, which appeared in the 'Courier' some time ago, regarding the discovery of a number of toads found in a rock on the estate of Altyre, says:—"This fact was further confirmed last week by an examination of the men present at the blasting, who produced portions of the rock showing the precise spots where some of the toads were embedded. These were indentations on the stone of a size, but not so deep, of a hen's egg cut lengthwise in half. When the shot went off, the workmen ran to the spot and found the toads scampering away. The nests which became exposed in the solid rock by the blast, appeared to have a coating of soft black viscid stuff, in which the toads had lain. The rock is not sandstone, but a kind of conglomerate, very compact, but with open spaces, around which crystals of silica appear. That the toads were embedded in the solid rock we have no doubt whatever, but, to make assurance doubly sure, the workmen are to carry large pieces of the rock to a given place, where they will be broken leisurely and carefully, in the presence of intelligent witnesses, who will be at no loss to verify the facts which may be presented."'

This statement, resting on the authority of Sir A. Cumming, is unimpeachable. No one, I mean, would venture to deny that a number of toads were seen to issue from 'a seemingly unbroken bed of rock from fifteen to twenty-four feet from the surface.' The question then hinges on the fact, whether the bed of rock which *seemed* to be unbroken, *was so* in reality. It will, I presume, be granted, that if one trustworthy witness actually saw a communication between the retreat of the imprisoned toads and the surface of the soil, his evidence would outweigh the greatest possible amount of negative testimony.

The precise date of the discovery of the toads I do not know; but one day, towards the end of April, a gentleman who resides in the neighbourhood of Altyre, and who had heard of the occurrence, determined to investigate the matter by actual inspection. He was joined by two friends, one an M.D., the other a clergyman, whose name is well known as a geologist; and the following extract from a letter, dated June 4th, contains the conclusion at which they jointly arrived: — 'Not being sure of the exact spot, I asked a respectable-looking workman, apparently a foreman, where the live toads had been found. He went a little way with us along a cutting, and pointed out the place, using these words: — "They were got just there, where the red seams begin, and along this way for some yards." Immediately above the rock lie from six to ten feet of boulder clay, beneath which the surface of the rock seems a good deal fissured and broken up, the fissures, "the red seams," being filled up with clay.

As the cutting went deeper, the rock became more solid, but still, all along, where it was pointed out to us that the toads had been found, the rock seemed to be of such a nature as to admit of water and tadpoles being carried down a considerable way into it, by means of small fissures and cracks. Once there, it is but natural to suppose that tadpoles would become frogs and toads.'

The above extract does not account for the 'presence of toads in large pieces of solid rock;' but I am informed that the promise contained in the 'Forres Gazette' had not, on the 4th of June, been fulfilled. Either 'larger pieces of the rock' have not yet been carried to a given place to be broken 'leisurely and carefully in the presence of intelligent witnesses,' or, if they have, no facts worth verifying have been presented.

### *Flight of the Swallow Tribe.*

Rapidity of flight in the Swallows, great though it is, seems to me less surprising than the power which they possess of suddenly altering their course through the air. A greyhound pressing closely on the track of a hare, should the chase suddenly double, shoots ahead and not improbably misses his victim. A well-known law of nature compels him to continue his course in the same direction, until, by an exercise of strong muscular action, he has overcome one motive force and set up another. Not so the aerial hunter. By a few wavings of his powerful wings, the Swallow soon attains a degree of speed far sur-

passing that of the Greyhound; and the impetus once gained is confined to no prescribed line of flight. For a few seconds it may be horizontal, and tending, we will say, towards the east. The hunter is beating the air for game so minute that the sharp eye of even a bird fails to discover it at the distance of a few yards. Unlike the Greyhound, which is slipped from the leash only when the expected prey is discovered, the Swallow is a freebooter cruising on a roving commission, ready to make a prize of whatever he may encounter; and woe be to the midge or beetle that crosses his course. And even if, in the midst of his headlong career, a moving speck be descried in the air, above or below, to the north or to the south; at the instant that the object is descried the will of the bird alters the position of its sails or rudder with relation to the medium through which it flies; the resisting air becomes at once a motive agent in a new direction, and the bird, without exhausting its inertia, aims it with unerring precision at the prey, which is captured before aware of the existence of its pursuer. It would be a nice calculation for a mathematician to decide which of its feathers the bird should employ under given circumstances; what angle they should present to a head wind, a side wind, a fair wind, or to a calm atmosphere; yet each of these problems, modified by a thousand circumstances, a Swallow resolves at the instant, or its hungry nestlings would gape for food in vain. Marvellous, indeed, that this instinctive practical application of physical laws should be

exercised by a creature which not long ago was elaborated by a little warmth from a mass of jelly enclosed within a thin shell of lime.

*August 30th*, 1860.

Removed a cap from a cottage-hive to-day. It was quite full of delicate white comb, and heavy with the purest honey. Though taken at midday, it contained a great many bees, and among them, I presume, the queen. I accordingly placed it on the ground, in such a position that the bees might make their way out beneath and return to the hive. All the afternoon there was a great buzzing around it, arising, I imagined, from the anxiety of the bees to escort their sovereign back to her proper palace; but going in the evening to take possession of the honey, I found that the comb had been torn to pieces, the cells rifled of their contents, and not a particle of honey left. A few dead bees lay on the ground, amid a large quantity of minute scraps of wax, the ruins of the cells. Whether the hive was plundered by its proper owners, or by the tenants of other hives hard by, it was impossible to discover. I imagine that the latter must have been the case, as such an accident never happened when I have taken a cap from a hive standing alone.

*Sept. 2nd.*

The dry seasonable weather which has recently set in seems to have revived the spirits of the birds, and called back their musical powers. The Tits are

beginning to be heard again, and the Nuthatch has resumed his whistling note. There were several Pied Wagtails about the garden yesterday, chasing one another through the air, and uttering their double chirrup as in spring. I heard also a Chiff-chaff, but his note was not nearly so clear and cheerful as it was during the breeding-season. The Nuthatch makes himself frequently heard. He has two notes; one a twitter very like the noise made by throwing a pebble across a frozen pond, the other a high whistle becoming sharper towards the end and repeated five or six times or more in tolerably quick succession. The former is his autumnal and winter note, the latter is most frequently heard in spring, but he has employed it many times during the last few days. Swifts, Swallows, and Martins have all disappeared from this neighbourhood; but I saw several swallows to-day flying about near the canal. The unusual cold of August must have diminished the number of flies; but they are plentiful enough now. Had the Swallows been patient but for a few days longer, they would probably have deferred their departure till the usual period.

*The Note of the Land-Rail or Corn-Crake.*

A bird that never flies might be imagined to have some difficulty in providing for its safety, especially such a tell-tale bird as the Corn-Crake. But, besides its lurking propensities, it has an additional guarantee of safety in this curious fact, that while performing its plain song, it so manages its voice that the place

from which the note proceeds seems to be constantly shifting. The hearer is convinced that he hears but one bird, yet that one is now to his right and now to his left, sometimes twenty yards from him and immediately afterwards fifty. He may be walking (as I once well recollect happened to myself) along a broad road, and hear the unvarying 'Crake crek' in a field on his right hand; he is convinced that the bird cannot cross the road without his seeing it; the next 'crake' may come from the same direction, but the concluding 'crek' of the passage seems to have been spirited across the road, and to proceed now from the field on his left. The consequence is, that it would be as idle to hunt such a bird by the ear, which is always receiving false tidings, as by the eye, which can detect nothing.

### *Migration of the Land-Rail.*

How a bird that exercises its powers of flight so little during five or six months of the year is able, twice a year, to face so long a voyage as that across the channel; why it crosses the water at all, and why it extends its voyage to Ireland, are questions which it is not easy to answer. An author quoted by Rennie states that a young Corn-Crake which he kept in captivity was exceedingly fond of water. 'It would swim, dive to the bottom, and play about with the greatest possible satisfaction, and with as much activity as if it had never been used to any other element.' Macgillivray, whose account of this bird is very interesting, says: 'In an oat-field in

Harris, I once shot at a Rail that suddenly rose between my feet, when, apparently not having been hit, it flew off in a direct course to the sea about four hundred paces distant, where, to my surprise, it alighted, and floated motionless, sitting lightly on the water, like a Coot or Gallinule. Soon after, a Black-backed Gull coming up spied it, and uttering a loud chuckle of delight, descended with rapidity and carried it off in its bill.' If the above statement be correct, of which there is no reasonable doubt, some light is let in on the question; for a bird that, when alarmed, will fly out to sea and sit motionless on the water, and can, moreover, swim and dive, must, it is fair to infer, have the power of taking wing from the water; and, in this case, the Corn-Crake with its imperfect powers of flight may be well supposed to perform its migrations partly by using its wings, and, when they are tired, by alighting on the water and either resting, or paddling its way onwards. The Woodcock has been observed to alight for the purpose of resting on the smooth water in the wake of a ship at sea.

*Sept. 9th.*

In order to ensure a supply of Mignonette during winter and early spring, I am in the habit of rearing singly in small pots from a dozen to twenty plants. As I sow about midsummer, the seedlings are now three or four inches high, and, my object not being to induce rapid growth of foliage so much as plenty of roots, they have a few leaves only, and those not

very luxuriant. Looking at them this morning my eye was arrested by unmistakable signs of the presence of minute Caterpillars, and on a closer examination I found that, with one or two exceptions, every plant was infested. Mignonette generally, whether in a conservatory or in the open air, is liable, at this season, to the attacks of Caterpillars, which first eat the tenderest leaves, and when these are consumed devour the young flower-buds. The flowers consumed, they repair to the mature foliage, and as each plant is infested by a large number of the voracious creatures, it often happens that a bed of Mignonette becomes an unsightly mass of bare stems long before the flowering season has drawn to a close. The best recipe which I know for destroying Caterpillars is a sharp eye, ready fingers, a patient temper, and a strong desire to preserve the crop in danger; but even these do not always succeed when a crop of Mignonette is threatened: for the enemies are numerous, their colour exactly corresponds with that of the plant which they infest, and moreover, they feed by night only, either hiding under the concave leaves by day, or stretching themselves along the stems in an attitude which, no doubt, is as favourable to digestion as it is efficacious in concealing them from impertinent intruders. In a very few days the fate of my young plants would have been sealed, had I not discovered the colony. What is worthy of remark in the incident is this: The moth (*Phlogophora meticulosa*) which laid the eggs whence the Caterpillars proceeded must have visited the seedlings

in succession, and left on each a family proportioned to the size of the plant which was destined to supply them with food. Had all the plants been growing in a pan together, one might have supposed it possible that all the eggs were laid together, and that the young Caterpillars when hatched, might have dispersed in quest of nourishment; but this, in the present instance, was plainly impossible. The pots stood in a row, at a distance from each other, so that the creatures could not have taken this open order without possessing a power of calculation and a knowledge of tactics beyond the capacity of infant Caterpillars. But even if it was wanting in them, the moth must have been endued with an intelligence surpassing the blind teaching of instinct. And whence was that intelligence derived? In all probability the moth died before her eggs were hatched, utterly unconscious of the future destiny of her family, and never having had any perception of the history of her own life—that she had herself been an egg, a grub, a pupa. Surely then, when she laid her eggs on the leaves of plants which afforded no food to herself, and distributed them so judiciously, she must have been an instrument employed by an intelligence superior to her own, and if so, superior to that of any created being; for no created being could have imparted to her the knowledge on which she acted. A cat may teach her kittens to play with a mouse; young birds may learn from their parents to fly; but from the insect world all teaching, whether by precept or example, is absolutely excluded. The

grub does not possess the necessary organs for imitating the parent, whom indeed it never knew; and the fly can have no recollection of a stage in its existence from which it is separated by the death-like sleep of the chrysalis.

Does not this incident suggest that in the insect world there is no room for the modern doctrines of development and selection?

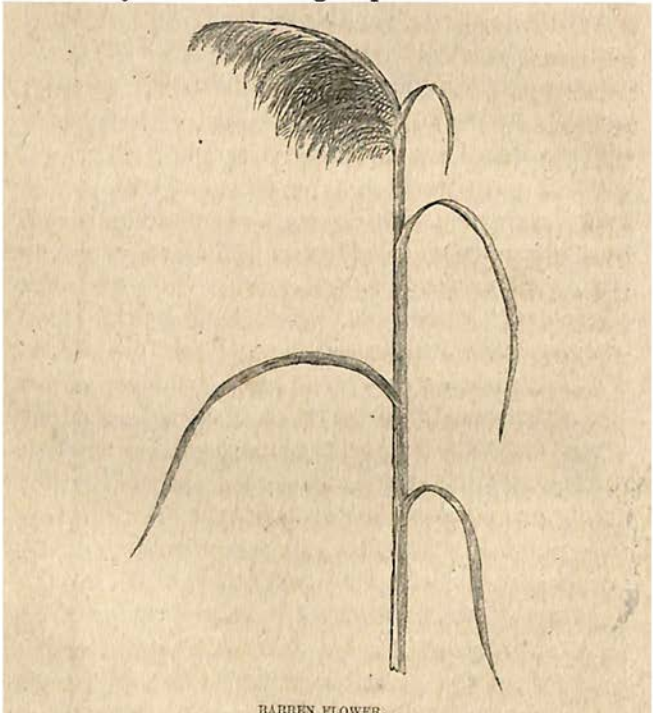
### *The Pampas Grass.*

No more valuable addition than this to our ornamental garden plants has been introduced for some years; yet so many among my own friends and neighbours have procured it and have been disappointed, that, for the benefit of those who have been equally unsuccessful, I submit the result of my own personal observations.

Of the Pampas Grass there are two forms,—not, be it observed, two varieties, but two *forms*, or, more correctly, *sexes*. The one, which I will call the *fertile* form (though I am not aware that fruit has been perfected in this country), when it has arrived at maturity, displays, in the summer, a large circular tuft of leaves several feet long, bending gracefully outwards and reaching to the ground, presenting a not too fanciful resemblance to a fountain. From the midst of this tuft there begins to rise, in September, a varying number of stalks sheathed with leaves like those which constitute the tuft. The stalks grow quite erect and very rapidly, often completing more than an inch in the twenty-four hours, as I have

repeatedly tested by actual measurement. Towards the end of October, each of these has perfected a dense slightly-spreading panicle about a foot long, of such flowers as the true Grasses bear, but containing pistils only, so feathery as to wave in the slightest wind and glistening like silver filagree-work. An early frost, such as that which gardeners mourned over in the October of 1859, is likely to injure the stalk materially, and deprive it of the power of resisting the storms of November; but in ordinary seasons it will stand, with little impaired beauty, until late in the winter. This is the kind which everyone who has a grass-plot twenty feet square should grow in its centre; and no more stately object can be desired. The other form of the plant, which I will call the *barren*, and which bears stamens only, resembles the first during the whole of summer, only it is somewhat more robust and not so graceful in the droop of the leaves. About a month after the other, this too begins to send up flower-stalks, but not quite perpendicularly; nearly all of them diverge more or less to the sides. Unlike those of the fertile plant, they grow slowly, and do not show the top of their panicle through the sheathing base of the leaves until the second or third week in October. In the year 1859 no flower appeared until the second week in November, though the panicles of the fertile plant were in full perfection before the close of the preceding month. By this time the temperature has diminished to such an extent that their growth is suspended, and the stalks, being full of juices, are nipped by the first severe

frost; they turn brown and wither away. This is the form of the plant which several of my friends have planted, and, as they imagine, have failed to treat rightly; the true reason of their failure being, that they are cultivating a plant which the short

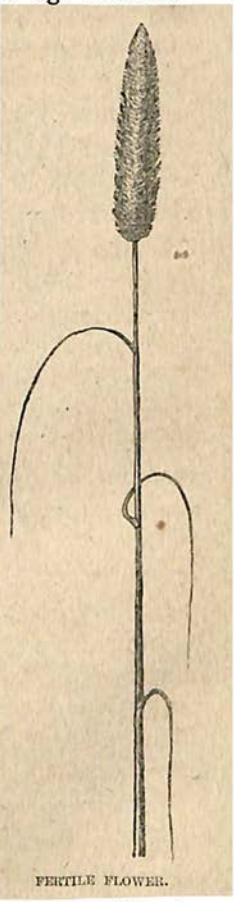


BARREN FLOWER.

summer of this climate will not bring to perfection in the open air.

And now comes the question, how can the two be discriminated? I have cultivated both forms, and

will state the result of my own observations. My fertile plant I purchased eight years ago in a four-inch pot. I planted it in the centre of a circular bed about ten feet in diameter, in rich soil, and gave it plenty of water. In the fourth year it sent up two noble spikes, in the next six, in the next twenty-two; and this year it has sent up no less than sixty-three magnificent plumes, the tops of which are from eight to nine and a half feet from the ground. The distinguishing characters are these: the branches of the plume spread out slightly, and do not droop at all, or scarcely so; each flower, when examined by the lens, is found to contain an embryo seed, bearing the two diverging feathery stigmas to be found in most true grasses; the chaff is surrounded by numerous fine silvery bristles; a flower-stalk, measured at a joint near the bottom of the stem, is *an inch and a half in circumference*; a leaf, measured about the middle, is *three-eighths of an inch across*. The flower of the barren plant is not accompanied by bristles; the branches of the panicle are much larger than in the other, and droop most gracefully; the flower-



FERTILE FLOWER.

stalk measures *two and a half inches in circumference*, and the leaves are *five-eighths of an inch across*. I should add that the barren plant makes an attempt to flower in its second or third year, but as long as I have grown it has never perfectly succeeded. It is, however, a handsome plant, and its spike is, as an in-door winter ornament, far more valuable than that of the other. Most people would scruple to cut the spikes of the fertile plant until the frost has done its worst with them; they are then, however, of little worth, for the outworn flowers easily separate from their stalks, and fly about the room like so many feathers, to the great horror of careful housewives. Not so with the other: the flower-stalks of these should be cut in November, divested of their leaves, all except the sheathing base, and be stored away to dry. In the course of a few weeks, each will have the appearance of a long white rod, bearing a small tuft of feathers at its extremity. The sheaths must now be carefully removed, the last being split with a penknife, and within will be found what appears to be a stick of frosted silver, a foot and a half long, but is, in reality, a multitude of closely packed abortive flowers, which, when shaken out, form the most graceful of all possible decorations of a chimney-vase.

Let anyone purchasing a plant, choose the one with the narrowest leaves. In order to secure vigorous growth and abundance of spikes, I would recommend that a shallow trench should be dug round the plant in spring, and, after receiving a barrowful of manure, be filled in again. It pre-

fers a moist soil; but if this be unattainable, it should have a few cans of water every evening in dry summer weather. In spring all the sheaths of dead leaves should be pulled out by hand, and all the leaves which have survived the winter should be cut well back. The immediate effect will be unsightly; but in the course of a few weeks a new set of leaves will be pushed forth, which will curve all the more gracefully from not being impeded in their growth by the rigid remains of the previous year.

In the year 1862 my narrow-leaved plant sent up so many spikes that I removed about twenty, in order to allow the remainder full room to expand. The winter being unusually mild, the stalks were not once penetrated by frost: consequently the spikes have stood erect until the present date (May 1863), retaining their stately form, though their silvery sheen has been scattered by the winds.

My broad-leaved plant was to all appearance killed by the winter of 1859. I accordingly rooted it up and discarded it, but nevertheless allowed it to stand erect on the rubbish heap, in case it should in the following summer show any signs of vitality. A single tuft only of leaves retained a tinge of green. This was separated from the lifeless mass, and being carefully treated was restored. Last year (1862) it had become a flourishing plant, and produced a single spike, which continued to enlarge till late in the winter, having, before its growth was arrested, attained a stage nearer to perfection than any I had ever before observed. It has withstood all the storms of spring, and, never having been indebted

for its beauty to the feathery appendage of the ovary which characterises the fertile plant, has undergone no change. I consider this kind of Pampas Grass admirably adapted for planting in the centre of a roomy conservatory. Protected from frost it would no doubt perfect its spikes of flowers, and retain them in undiminished beauty until superseded by new ones. It would have one decided advantage over Palms and Tree-ferns in such a situation, namely this, that its height being definite, it would never attain such dimensions as to entail the necessity of raising the roof of the structure. But, whether grown in a conservatory or in the open air, it should stand alone, neither having its stately symmetry encroached on by other plants, nor its dimensions dwarfed by the vicinity of trees. The same remark applies equally to the narrow-leaved form of the plant. Standing absolutely alone it is the most striking feature of a lawn: mixed up with other growths, half of its beauty is lost.

*October* 1*st.*

Late as it is in the season, I have at various times during the last few days heard the unmistakable note of a Chiff-chaff in the trees in my garden. This morning I heard it from my house, and looking out of window, saw one hunting about for insects in an apple-tree, the branches of which were distant only a few feet from me. Once it fluttered towards the window in chase seemingly of some winged insect. It came so near that I could clearly distinguish the light mark over the eye. There is nothing

especially remarkable in this incident, except that the locality is exactly that which I have elsewhere* noticed as being selected for a hunting-ground by a bird of the same kind in early spring. The first of October is late to hear the note of the Chiff-chaff, and I could not help fancying that it was the identical bird which annually visits this spot, come to say 'good bye' before his departure for the winter.

### *Glow-worms.*

Returning late at night from a lecture at ——, Hertfordshire, my road led me through a low meadow, among the short grass of which were a large number of Glow-worms, shining with a light subdued, indeed, as contrasted with the clear green brilliancy of the perfect insect which we meet with in our summer evening walks, but still sufficiently bright to be distinguished at a distance of many yards.

It is probable that, as is the case with many other insects, the proportion of Glow-worms which go through all their metamorphoses and attain the imago or perfect state, is small. I have often, for the sake of whiling away the time, counted the Glow-worms I have seen during a summer-night's walk in Devonshire and other places where they are abundant, but this evening the sparks were so numerous as to defy calculation in any other way than by counting the number in a square yard, and thence forming an estimate of the contents of the whole meadow. I recollect, too, on another occasion, whilst paying a

* *British Birds in their Haunts.*

visit in Dorsetshire, to have seen a grassy bank studded in a similar way. The season was autumn, about the end of August, when, of course, the larvæ are younger and smaller than they are in October; but as well as I can recollect, the brilliancy of the light on the two occasions was nearly equal, being hazy and less decidedly tinged with green than that of the Glow-worm in its perfect condition.

Of the many persons who have taken Glow-worms from their native haunts, and after carefully carrying them home have deposited them in a plot of grass or flower-bed in their gardens, few, perhaps, are aware that the Glow-worm is the wingless female of a beetle (*Lampyris noctiluca*). The male has limited powers of flight, and is less frequently observed out of doors than in the rooms of houses where artificial lights are burning, and in which the windows are kept open in the evening. The first which I ever saw was brushed off from a lady's neck, on which it was discovered crawling. On another occasion, several of these insects paid an evening visit to the drawing-room of a house at which I was staying in Kent, and I have detected them a few times crawling among grass in the open air. They are smaller in size than the females and far less brilliant.

Glow-worms first make their appearance, after passing from the nymph to the perfect state, about the middle of June, and remain visible until the end of July or a little later. They are observed to shine most frequently on calm dewy evenings, and are more brilliant before than after midnight. The light

is given out from the under side of the three last segments of the body, the tenth, eleventh, and twelfth. In the tenth and eleventh, it forms two broad bands extending across the whole surface. In the twelfth, or last segment, it is feeble, and appears merely as two bright spots.'

There are few persons resident in a part of the country where these insects abound, who have not on many occasions taken Glow-worms into their hands with the intention of carrying them home, either to show to their friends or to deposit them on some bank or grass-plot near the house to be examined at leisure another night. The result has been, I imagine, the same in every case. Within a quarter of an hour, the insect has withdrawn the light from the tenth and eleventh segments of the body; but the two bright spots in the last segment have remained visible. On the following evening, perhaps, the Glow-worms have reappeared in their original brilliancy; but in the course of a few more nights the majority have either disappeared entirely, or their light has faded away to a couple of dim sparks. Of a dozen thus brought home, not one, probably, is to be found at the expiration of a week.

The reason is the same in every case. The Glow-worm, after it has passed its last metamorphosis, lives but a short time. The whole period during which it continues to shine is rarely more than fifteen or twenty days. During the first few evenings only of this period is the light brilliant. As soon as the Glow-worm is ready to lay its eggs, the spark becomes

every evening less and less vivid; and after the eggs are deposited, either the insect dies, or, if it lives on till the following year, it passes its nights in darkness. I have only once seen a perfect insect so early in the year as March. This was found crawling over some moss on the skirt of a wood, and had probably been excited from hybernation by the warmth of the day, which had sent it on a foraging expedition. The female insects, it is known, feed in their perfect state; the males do not.

The eggs are laid on the exposed fibrous roots of grass, to which they adhere by a viscid fluid enveloping them. They are at first slightly luminous; but this property is attributable to the fluid with which they are surrounded, as they soon become opaque.

In about six weeks, or perhaps less in warm weather, the eggs are hatched; and it has been observed that on the day before the larva is excluded they become slightly luminous. The larva itself, on its first appearance, is of a delicate straw-colour, but on exposure to light it assumes nearly the colour of the perfect insect, and consists of thirteen segments, including the head. It moves with considerable activity; its onward motion being mainly effected by means of the final segment, which serves the purpose of the prolegs of herbivorous larvæ in assisting the progress of the body.

Herbs, however, form no portion of the food of Glow-worms. Notwithstanding the mild effulgence of their emerald spark, they are pre-eminently carnivorous,

and in their way are as destructive as that tyrant of the insect world, the Dragon-fly. From the time of their leaving the egg they are luminous, but during their first stage the light proceeds only from the under surface of the twelfth segment of the body; nor does it appear to be continuously emitted. On the occasion to which I have referred above, October 1, the light was sufficiently brilliant to be perceptible at a distance of several yards; but Mr. Newport, who made these insects a subject of special study,* says that the brilliancy is not permanent, and its degree of intensity is not sustained; it is given out moreover only when the insect is in motion, and even then only in flashes and scintillations. The temperature, too, and other atmospheric influences may affect the insect, as he remarked no scintillation in the larvæ which he observed, though they extinguished their light almost immediately they were taken into the hand. The individuals which Mr. Newport kept in captivity emitted a bright light when well fed only, and he noticed more than once, when they had been exposed to light, either artificial or that of the sun, that on the sudden removal of the illuminating influence they had ceased to shine.

They change their skins frequently during the larva state, and at the approach of winter pass under the roots of grass, where, becoming torpid, they hybernate. When in this condition, if touched gently they move the body and emit light, sometimes with considerable brightness.

* Journal of the Proceedings of the Linnæan Society, vol. i.

The food of Glow-worms is believed to consist exclusively of snails. Their method of feeding is as follows:—A larva having discovered a snail in motion, approaches it cautiously, raising the fore part of its body, and steadying itself on its prolegs. It then draws itself back, as if to gather up strength for a blow, and makes a sudden bite with its extended mandibles on some exposed part of its intended victim. The effect produced is such as to warrant the conclusion that the mouth of the Glow-worm is furnished with a fluid which paralyses the snail, and deprives it of life. Snails have been pierced through and through, close to a vital part, with a needle, and have seemed to suffer no inconvenience, but the bite of a Glow-worm is followed by the most marked results. The wounded animal writhes under the blow, and withdraws into its shell, but being unable to remain there begins crawling again; the injured part loses all power, and the snail, if a small one, infallibly dies in less than two hours. But the larva does not confine its attacks to small snails. It fearlessly encounters full-grown specimens of the common banded snail of our hedges (*Helix nemoralis*), and by repeated wounds, followed by similar results, never fails to deprive it of life. A larva, when attacking a small snail, deals its blows indiscriminately on any part exposed, but when it meets with a large one, it wounds it several times in the foot near the shell before it ventures on the head; and experiments made by Mr. Newport and others prove that a second and third blow dealt

by a larva are less injurious in their effects than the first; from which the inference is fairly drawn that the virus is partially exhausted by the first attack, and becomes less and less powerful in its effects after every fresh discharge.

'The voracity of the Glow-worm,' says Mr. Newport, 'is extreme. When they are only about half-grown, they will attack fiercely any new victim that may chance to be crawling near them, even though they may have fed plentifully on their prey but a few minutes before. Having killed a snail, they seldom leave it, except for a few minutes, until the whole of the body is devoured. They will remain for many hours with their heads buried in the body of the snail, gorging to the utmost, and plunging their small heads and erected mandibles into its viscera, which they continue to pierce and exhaust until all the juices of the body are drained. I have sometimes seen four or five larvæ crouched one upon another in a snail-shell feasting, and gorging upon their prey. In this latter respect they somewhat resemble in habit, as they do in general appearance and colour, the voracious larva of the Lady-bird, (*Coccinella*), which preys upon Aphides.

'But though an unclean feeder, the larva is nevertheless diligent to clean itself of the slime when its meal is ended.

'After the larva has finished its repast, it leaves the snail, retreats a short distance beneath the roots of grass, and begins to cleanse itself from the adherent slime. This process is effected by means of the

prolegs protruded from the last segment. With this apparatus the larva grasps its mandibles and wipes them and every part of its body to which any slime adheres.'

At the expiration of half and sometimes but a quarter of an hour, during which they are motionless, as in sleep, or as if fatigued, they will return to their feast as voraciously as before.

In May, or early in June, the larvæ cast their skin for the last time, and assume the condition of a nymph or pupa. The pupa-covering is exceedingly thin and delicate, and the insect, especially the female, undergoes but little change in anatomy. Both sexes in this state are luminous.

It has been observed, that the length of time during which the insect remains in the state of a larva varies considerably, being dependent, among other causes, on the temperature and on a sufficiency of food. Of a brood reared by Mr. Newport, the most advanced individuals underwent their first change of skin in nineteen days, and their second also in the same length of time; while others had not, at the expiration of the thirty-eight days, entered on their first change. The succeeding changes are protracted in a yet greater degree, so that the Glow-worm occasionally passes more than an entire year before it becomes a nymph. The latter stage it passes through in a period varying from eight to fifteen days, according to the temperature, always becoming a perfect insect in June or July.

*October 2nd.*

Fruit-gathering is to the proprietors of a small garden a kind of harvest into which all the members of a household enter with far greater glee than into any of the other garden occupations. Unless one happens to be a thorough amateur gardener, the operations of digging, raking, weeding and sowing are all wearisome after a time; but the gathering in of Apples, Pears, Plums, and Filberts is merry work for all ages.

First comes the hunting up of all the baskets and hampers which have been lying about as useless for months; ladders of all lengths, house-steps and kitchen chairs are carried off in triumph. The strongest of the party superintends and does less of the actual gathering than anyone. His business is to plant and shift the ladders from time to time, and to keep a sharp eye on his younger fellow-labourers. Not that he is afraid that they will appropriate too much of the fruit, the fact that Apples and Pears are eatable seems to be lost sight of for the time; but young heads are giddy. The best climbers among the party consider their vocation to be to mount the highest branches, and are apt to forget in their excitement that in their hasty struggles to ascend they may shake down and so damage more fruit than they actually gather; or they may venture on a branch not strong enough to bear their weight, and so descend precipitately, bringing with them a bough as well as its fruit. Now and then a larger

proportion of fruit is shaken off than the circumstances require, when a cry of caution is necessary. Some of the party, the most skilful at a catch, stay below. They need a quick eye and a ready hand; for when the gatherers have filled their pockets, they proceed to empty them by flinging down the fruit one by one, and if those whose business it is to look out for the catches fail to keep a good watch, a blow on the head or face summarily punishes them for their awkwardness. One apple-tree cleared, the leader calls out 'Now for the tall pear-tree,' and away the party hie with all their apparatus of ladders and baskets to a fresh scene. Before the bearer of the long ladder is on the ground, the smallest of the party has swarmed the bole of the tree, clambered with enviable elasticity through the crossing branches, and is swinging to and fro on the topmost bough to the terror of all who only know what climbing is, by having seen what some can do in that way. He must come lower, however, and the topmost pears must be left for the Blackbirds if need be; for if the bough should snap, though he probably would lay hold of some other branch and break his fall while on the way, yet the tree would be damaged, and the climber next below would receive an awkward thump by the sudden impact of his friend from above. The Pears have been forbidden fruit until to-day. Many an arch remark has been made on the alteration in their colour, on the probability of their being stolen, or the inroads that Wasps are beginning to make on them (Blackbirds happen to

be the real culprits, for of Wasps there are hardly any this year), of the number that are blown down by every high wind, and the yet greater numbers that fall during a night's rain. And now the embargo is removed: everyone may pick; nay! he is most praised who picks the most.

Young people cannot be wholly free from fun even while they are working. It is to be doubted, therefore, whether the blow on the head which one or another occasionally receives is purely accidental. The cry 'Look out, there!' seems to have come after the fall of the Pear rather than to have preceded it; and the jovial laugh from above would seem to indicate that the whole of the laugher's attention was not engrossed by the useful part of his work. It is just possible, too, that the looker-out below might, if he had been careful, have avoided giving a push to the rickety ladder, and so terrifying its occupant; who, suspecting it to be coming down by the run, anchors himself instinctively to the branches, and prepares to 'let himself down easy.'

In spite of all the fun, a deal of business is got through; the great hamper is pronounced full; some of the party make for the Damson trees, which are not tall enough to require ladders, and a reward is promised to the one who can produce the greatest number. A new element of rivalry introduced, the work proceeds swimmingly; but Damsons are not abundant this year, so that the most industrious gathers little more than a hundred. Some too are unlucky; one of the party especially considers himself badly used,

for the tree in which he climbed had only one on it, and by the time that he had descended and mounted another, he was so far behind as to have lost his chance altogether.

And now away to the Filberts. There remain plenty of Apples to be picked, but they are looked on with the same eyes as a piece of ground which will take many more hours of hard work before it is dug all over: they will keep till to-morrow and next day, when those who were bruised by the accidental fall of Apples and Pears to-day will have their turn at dropping and their revenge together.

I would not recommend anyone gathering Filberts to place the result of his labours, even for a few minutes, in his pockets. The long green husk which closes over the nut forms a dry, sheltered, and secure refuge for insects, a fact well known to the disgusting little creatures which, beautiful as are their wings, few people can abide—earwigs.

We gathered one Filbert to-day, to see if they were ripe, and knowing what to expect, peeled it tenderly, and on turning back the husk, found no less than three of these vicious-looking pests ensconced in what they no doubt considered a very citadel for concealment and safety.

*October 5th.*

I heard the Garden Warbler in full song to-day and yesterday; and in the evening, while walking in a wood, I heard three several Wood Pigeons cooing. This is, I believe, unusually late. I was much struck

by the general silence of the woods, owing to the absence of birds, most of which have returned to gardens and orchards, where the small fruits afford them abundant food without the trouble of searching. Sparrows, Chaffinches, and Yellow Hammers frequent corn-fields, especially those which are bordered by trees and tall hedges. In these they conceal themselves, and make inroads on the crops when no one is in the way. It is hard to believe that they are not conscious of dishonesty; for no sooner does anyone enter a corn-field than a flock rises and takes refuge among the thick foliage until the danger is past.

Yesterday morning, about four o'clock, as some workmen were going along the common to work, they observed symptoms of fire in an unusual place, and discovered that one of Mr. B.'s hay-ricks was on fire. No time was lost in arousing the inmates of the house, but the mischief had gone too far to be arrested. All hands were summoned to fetch water; wet sheets were thrown over an adjoining rick, and water was poured on the burning mass to prevent it from bursting into flames. To-day it is a smouldering mass of ashes, preserving the original form of the rick, but diminished in size—a solid heap of hay, encased in a shell of embers, with tongues of flame playing out here and there. The burning embers are nearly everywhere covered with consumed ashes, and the whole presents the appearance of a sandstone cliff imperfectly stratified, and traversed by irregular perpendicular columns. There being no engine

within six miles, it is proposed to let it burn itself out, care being taken to keep the fire under as much as possible on the side nearest the other rick, and to keep that constantly wetted. The rick contains about thirty loads, valued at 120*l.*; the lower portion consists of clover hay, which had been saved in tolerable order three months ago; the upper portion was meadow hay, which was laid on the top of it, not well saved, from time to time afterwards. Clover is not good unless it heats to a moderate extent, but this had become overheated, and the rick was not cut open as it ought to have been. I have smelt a suspicious odour proceeding from it for some weeks past, as I went by the place.

*October 9th.*

The rick is still smouldering away, and will probably continue to burn for a day or two longer. Thrusting my stick into the ashes, I felt a resistance, as if it had encountered something hard. On examination, I found that the salts contained in the clover had fused into a mass, and assumed much of the appearance of pumice-stone. In many instances the form of the stalk was preserved, though now composed mainly of hard substance. The ashes are very salt to the taste. I carried away a lump, and placed it in a watering-pot full of water to dissolve. On emptying the solution next day, as liquid manure for the plants in my green-house, I discovered that the salts had decomposed the paint at

the bottom of the watering-pot, all of which came off in soft flakes.

*October* 16*th.*

Found the shell of a dragon-fly larva attached to the trunk of a lime-tree near the pond on the common. One of the children produced a pin, with the intention of capturing the insect alive, and was much surprised to hear that it was only the case. It was perfect, except that the back was ruptured. We found also the caterpillar of some lepidopterous insect attached by its hind legs to the trunk. Its body formed an acute angle with the trunk of the tree, and resembled in position, colour, and figure one of the small twigs which spring from the trunk of the lime. If touched, it showed scarcely more vitality than a twig, bending under the finger, and immediately recovering its position.

*October* 19*th.*

I observed this morning in my green-house, suspended seemingly by a cobweb, what I thought was a small specimen of snail (perhaps *Zonites pellucidus*), which had fallen from a leaf into a cobweb, and was trying to extricate itself. On closer examination, I saw that it was hanging from a single thread, and was not a snail at all, but a small grey slug. The thread by which it was suspended was attached to the middle of its body, and the animal was twisting itself about, evidently having some purpose in view, but what that might be I could not

conjecture. This manœuvring lasted for at least a quarter of an hour, at the expiration of which time, having something else to do, I went away; but returning soon after, I found that the position of the slug was altered. It now hung by the tail, head downwards, and with horns extended, and was evidently descending. It hung perfectly free in the air, oscillating and rotating by the agency of the wind, and was clearly letting itself down by an action of its will. One extremity of the thread was attached to a verbena twig, the other, as I have said, to the creature's tail. The plant was growing in a pot placed on the bars of a wooden stand, in such a position that, if the slug had continued its downward journey in the same direction, it would have passed between two bars to the ground, a distance of about four feet. I placed a leaf across the bars, directly beneath it, and was again called away. In about half an hour I returned to see what progress it had made. The slug had disappeared, though the thread was still there. I carefully lifted up and examined the leaf, to which the lower end of the thread was now fastened; but no slug was to be seen. I then examined the bars and adjacent flower-pots in order to find what had become of it, but was unsuccessful; nor could I trace by its slime in what direction it had progressed. I then looked under the bars, and was just giving up the search, when I saw my friend still dangling, head downwards, suspended from one of the bars, on which it had crawled from the leaf, and was slowly but steadily making its way towards the ground,

descending at the rate of about six inches in an hour. I was again obliged to leave it, and on my return, two hours afterwards, it had finally disappeared. What did this mean? I could only conjecture that it had crawled in quest of food to the extremity of the verbena twig, and finding a return by the way it came unpleasantly rugged, owing to the bristly hairs on the stalk of the verbena, had improvised an aerial descent to mother-earth, which it knew instinctively to be beneath it. The leaf and painted bars did not satisfy its requirements; so it made a fresh departure, hoping in time to reach its journey's end, but having strange misgivings either that it had lost its way, or that it had climbed much higher than it had any notion of. Of all living creatures likely to take an aerial flight, a slug is about the last I should have thought of; but there could be no doubt about the matter, for even if the descent from the leaf to the bars were an accident, there can be no gainsaying that the second stage was undertaken with some design.

### *Cunning of the Rook.*

It is a common belief in the country that the Rook scents gunpowder and always keeps out of shot of a man armed with a gun. I am not prepared to admit the truth of this proposition; yet Rooks certainly show themselves keen observers, and distinguish between field-labourers employed in their vocation and any idle saunterer, armed with either a gun or stick, who may chance to enter a field in which they are

feeding. Provided that ploughmen only are present, they will explore the furrows in quest of grubs within a few feet of the horses' heels; but on the appearance of a stranger, they take the alarm at once, and withdraw either to a distant part of the field, or to any high trees in the neighbourhood, and watch the movements of the suspected enemy. If he sets to work, and takes no notice of them, they resume their occupation; but if his intentions are evidently hostile, they withhold their confidence, and remove to some other feeding-ground. Experience has taught them that while they are picking-up grubs in newly ploughed land, the labourer does not molest them; but when they make inroads on newly planted crops of grain or potatoes, they are far more cautious.

As if aware that they are now robbers and no longer allies, they either pay their visits before the husbandman is astir, or when his vigilance is asleep. It is usual for the farmer, at this period, to construct a hut of boughs in some conspicuous place, and having concealed himself in it, to fire at and kill the first of the party that comes within his reach; the rest, connecting the danger with the hut rather than its tenant, make off with all speed, and venture no more within the dangerous precincts. A belief is prevalent in some places, that the Rook has the power of counting as many as eight, the number of its own digits or toes, but no more; so, it is said, if any number of men, not exceeding eight, go into such a hut while the Rooks are watching from neighbouring trees, they will not venture down until as many

enemies come out as they saw go in; but that if nine, or any other number above eight enter, they come down fearlessly when they have counted their toes, and are victimised by the ninth, who lies in wait. This statement the reader will, I dare say, admit when he has verified it by personal observation.

## *The Redbreast.*

The following anecdote of a Redbreast, contained in a letter addressed to a friend by a political prisoner confined in the island of Belle Isle, has, I believe, never appeared in English:—

'Last year, towards the end of autumn, a Redbreast, driven from the mainland no doubt by frost and snow, found an asylum in our island. Every morning he made his appearance in the court-yard of the prison, and flew several times round my cell, where he saw some of his feathered brethren captives. As I took care to throw him, at every meeting, an earth-worm or some crumbs, he did not fail to entertain a lively sympathy towards me. By and by, he followed my movements, and would not quit me. He followed me when I went into the yard, and came within arm's length immediately that he saw me digging in my little garden. Every evening, before he took his departure, he bade me good-bye with his simple winter song, which resembles the murmuring of a stream among pebbles and weeds. My fellow-prisoners urged me to catch him, but I could never bring myself to betray his confidence by depriving him of his liberty. One fine morning,

however, disgusted perhaps at my neglect, and finding the door of my aviary open, he hopped into the cage, and installed himself there without ceremony, and almost in spite of me. By the next day he had struck up an acquaintance with my other birds; he played with them, ate and warbled, as if charmed with his novel situation. From that time I have kept him as a living memento of better days. He now pries about me in all directions, hops upon my bed, admires himself in my looking-glass, perches on my bolster to sleep, and, when I speak to him, replies to me, in his sweetest accents, the song you know so well, so clear, so pure, and so plaintive. I well know the Redbreast to be familiar, inquisitive, and confiding. I have seen him in past times follow the shepherd boys along the hedges to pick up the scattered crumbs of black bread which they had dropped, or forage about among the field-labourers in quest of the little worms brought to light by the spade, the pick, or the plough. I have seen him, at the setting-in of winter, come into the farm-yard, and make his way into the sitting-room; but I did not believe him capable of such devotion to man, that he would proceed to the length of sacrificing his liberty in order to share the sorrows of a friend in captivity. At all events, I will not take advantage of the poor creature's attachment. He has given me his liberty and his song during the winter, and in spring I will restore him to freedom and verdure.

'P. S.—I have not ventured to tell you all. But the touching proof of attachment that my Belle Isle

bird has showed to me, taken in connection with another incident in my life, creates sometimes in my brain a passing idea, a dream, or whatever name you may be pleased to call it by. Once before, many years since, I was visited by a Redbreast. It was far away from here, in the midst of the sufferings of a long and painful illness, which had well-nigh proved fatal. The poor little bird never missed coming twice a day, morning and evening, to sing at my window, as if to encourage me to be patient, and hope for better days. I often fancy I recognise, in the voluntary companion of my present captivity, the sympathiser with my sufferings when I lay on the bed of sickness.'

## *Starlings.*

During the few days of unusually warm weather which we had this year, a number of Starlings were observed in a valley near Bath capturing flies after the manner of Swallows. They darted rapidly through the air, occasionally hovered or turned out of their course as if to seize some selected victim. Some perched on the higher branches of trees, and made excursions into the air in pursuit of their prey, which being captured, they returned to their perch, adopting for the occasion the habits of the Flycatcher. My informant, having had a statement to the above effect made to him, doubted its accuracy, and went to the spot to see it with his own eyes. He assured me that he witnessed it on two consecutive days, but only about the middle of the day, and while the sun

was shining. I could not learn from him what particular kind of insect constituted the chase; I did learn, however, that the hunting-ground was of limited extent, and that it was in the neighbourhood of a brook traversing some meadows.

As it is by no means uncommon for flies belonging to the family of *Ephemeridæ* to appear suddenly and simultaneously in large numbers, under favourable conditions of the atmosphere, it is very probable that an occurrence of the kind had taken place on this occasion, and that the swarm had been encountered by a flock of Starlings, and deemed worthy of pursuit.

### *Story of an Eagle Owl.*

A French officer, residing at Aveyron, had kept a tame Eagle Owl for many years. One day some country people brought him two young birds of the same species, still covered with their first down. These were confided to the care of the old bird, who, although a male, acquitted himself of his duties in a maternal manner, worthy, indeed, of a better recompense than that which he received; for no sooner had the young birds attained their full size, than they murdered their foster-father and devoured him. After this, the stronger of the two, a female, killed her brother and ate him, as she had done her father. The owner of the bird, shocked at the unnatural conduct of his unamiable pet, determined to get rid of it, and sent it to a friend at Toulouse, who was in quest of a mate for a male which he had in captivity.

The murderer of her father and brother could not change her nature, but before the honeymoon was ended, had killed and devoured her husband. This was her last act of atrocity; she died, a few days afterwards, not of remorse, but from a futile attempt to swallow a large piece of calf's liver, which stuck in her throat and choked her.

*Nov. 16th.*

A farmer's wife, residing at Carwythenack, Cornwall, purchased some oysters at Helford, and having carried them home, placed them, in order to keep them fresh, in a shallow stream which runs below her cottage. On the following morning she discovered that her store had been visited with felonious intent, but that the oysters had not only declined being abstracted, but had actually captured the thief and summarily punished him. A Water Rail, paddling along the stream, had thrust its beak into an open oyster, which had resented the intrusion by closing. The bird, unable either to extricate itself or to fly off with its captor, was kept a prisoner until it died of exhaustion, and has been preserved, together with the oyster, in the attitude in which it was found. It may still be seen in the Museum of Mr. F. V. Hill, Helston, Cornwall.

*The Aquarium.*

Many interesting facts in natural history have come to light through the instrumentality of the Aquarium; and I question whether it is possible for

anyone to establish a miniature pond so simple even as that which I am about to describe, without observing much that will be found both amusing and instructive.

Accompanied by some young friends provided with a shrimping-net and two bait-cans, I went to a small stream which communicates with the canal, and gave directions that every living creature met with should be brought to me. In a short space of time we had collected about twenty Sticklebacks, ten-spined and four-spined, three Minnows, a Water-Scorpion, a Dytiscus (a large water-beetle), Caddis-worms of several sorts, some specimens of *Limnæus putris*, Planorbis, and a few small crustaceans. To these animal trophies I added a few sprigs of Water-Crowfoot and Anacharis, and some handfuls of small pebbles selected from a place where the stream ran the swiftest, to ensure their being well washed. With these we returned home. I had previously filled an inverted glass dome with well-water, and placed in it two plants of Water-Soldier (*Stratiotes aloides*). We emptied the contents of the two bait-cans into the vase, and as it was now getting dark, left everything till the morrow. In the morning I examined my live stock, and was pretty well satisfied. The water was beautifully clear; the Sticklebacks, all but five or six which lay dead on the gravel, were in a state of great activity, and everything else in good condition, except the Water-Scorpion, which I never saw again. I took out two or three of the dead Sticklebacks, but being called away, left the others,

and forgot them till next day. My animals were now growing reconciled to their captivity, if plenty of room to move about in their own element can be so called. The dead Sticklebacks were disappearing, being half eaten up by their surviving fellow-prisoners. In a day or two their skeletons only were left, and, shortly afterwards, they too disappeared. The Water-Snails were feeding on the Water-Soldier, the Caddis-worms were repairing their houses with the leaves of the Water-Crowfoot, the Dytiscus plunging about with the clumsiest efforts to paddle with grace, sometimes rising to the surface, sticking his tail above water, and then descending with a silvery bubble of air attached to him. Some of the Water-Snails were travelling across the vessel in the same attitude in which a common snail would crawl along the ceiling of a room, that is, with body downwards, and with foot, as it is called, seemingly sticking to the air. I noticed something quite new to me; that while thus progressing, they leave a kind of slime on the surface of the water forming a trail, just as if a long strip of transparent film had been laid on the water. The little crustaceans alone seemed in evil case; they were sorely bullied by the Sticklebacks, shaken to pieces and devoured. One I saw in the mouth of one of these little tyrants, not quite dead, but hopelessly mangled, and about to be made a meal of. Within the last ten days I have begun to feed the fish, to their great content. I give them either exceedingly small worms whole, or larger ones cut up into very little bits. They have already grown

so accustomed to be fed, that when I go near the vessel they flock to the side nearest to me, swim about near the surface, put their heads above water in a kind of enquiring manner, surround my finger if I dip it in, and nibble at it, and have no scruple to take the particles of food from the point of my knife. I yesterday gave a small worm, about half an inch long, to a Stickleback double that length. He made off at a great rate round the vessel with his prize, and soon swallowed it, or at least made it disappear. A short time afterwards, I saw him writhing about, evidently disconcerted, swimming out of balance, and sometimes turning up one of his sides. He was clearly in trouble: the worm, not approving of the treatment he was receiving, had protruded his head through the opening in the fish's gill, and the latter was using his utmost efforts to retain his dinner, apparently nibbling at the extremity still in his mouth. To get the worm into his maw again by the way of his mouth was evidently impossible, for, whenever he turned, the worm accompanied his movements. He was soon, however, relieved by the kind offices of a friend, who seized the protruding part, gave one vigorous pull, released the poor struggling worm, and gulped it down himself.

I have tried feeding them with bread and finely chopped meat, but without success. Bread they take into the mouth and reject at once; the meat they seem to masticate but not to swallow. The bread crumbs finally disappear, eaten, I suppose, by the Water Snails; but the particles of meat met with

favour from nobody, and I was obliged to take them out, lest they should taint the water; though the Caddis-worms seem well pleased to eat any scraps of worm which escape the sharp eyes of the Sticklebacks. The Minnows are far less vivacious than the Sticklebacks; they are generally stationed near the gravel, under shelter of the weeds, and take a particle of worm occasionally with much gravity.

All my Caddis-worms had vegetable coats when first I procured them. Some of these make their cases of the leaves of Water-Crowfoot, placing them at right angles with their bodies, so that they seem covered with spikes; the larger ones prefer shreds of Stratiotes, which they attach to their bodies longitudinally, so that their case is a tube, having the appearance of being planked. As these materials decompose, both kinds add new portions of leaf near their heads; so that the newest portion of their dwelling is green, the middle straw-coloured, and the oldest part, beyond the tail, in a state of decay. They have the power of altering their specific gravity, for they can either float, crawl up a stem, or remain at the bottom. One or two of them have worked into their case small shells of bivalves and Planorbis which they found floating, and one has encumbered himself with a bit of rotten wood.

### *Mosses.*

A large majority of the common Mosses which form soft banks in woods and the skirts of commons belong to the genus *Hypnum* or Feather-moss. The

latter name is not a happy one, for although many of the family have a 'pinnate' or feathered mode of growth, there is a very large number of a totally different habit: some are in the form of trees, others tufted, velvety, silky, or resembling chenille. By far the greater proportion, however, are gregarious, and interlace their stems so as to form a cushion or pillow. Now there are numerous other genera of Mosses which grow in *cushions* of less or greater size, as, for example, those which cover the old thatch of cottages,* and many which grow on walls, rocks, and banks;† so that the name 'Cushion-moss' would be open to objection equally with 'Feather-moss.' But 'Pillow-moss' seems to me unexceptionable, not only as conveying a notion of softness and definite size, but as being almost a translation of the Greek *Hypnum*, given by Theophrastus to the tribe, and derived from a word denoting 'sleep.'

The young naturalist, however, will act wisely if he avoids the habit of employing English names at all, except when referring to objects in natural history which are known by genuine thoroughly recognised English names. To call a Primrose *Primula vulgaris*, or a Daisy *Bellis perennis*, in common conversation, would be pedantic, and would deservedly excite ridicule; but when reference is to be made to little-known plants which have no individuality except to a botanist, the use of a would-be popular

* Bryum capillare, and B. cæspititium.

† Several species of Trichostomum, Grimmia, Weissia, &c.

name seems to me to be a mistake. The name is not really a popular one at all, for the plant has none; very often it is not even English, but a barbarism, a Greek or Latin word with an English termination. For example, opening the 5th volume of 'Smith's English Flora,' page 91, I find four species of *Hypnum* described:—*H. Halleri*, *H. dimorphum*, *H. loreum*, and *H. triquetrum*. In the case of each of these plants the second name is simple and conveys a definite idea. The corresponding English names are, *Hallerian Feather-Moss*, *Dimorphous F. M.*, *Rambling mountain F. M.*, and *Triquetrous F. M.* Now the only one of these names which has any pretension to be 'popular' is the 'Rambling Mountain F. M.;' but I doubt whether a dozen persons in England know it by that name. Certainly the name would help no one to identify the plant, for there are several other species equally given to 'rambling,' and the Moss itself is far more abundant in woods than on 'mountains.'

The fact is, that if little known plants are to be named at all, they must be defined by terms intelligible to scientific men of all nations, and this cannot be unless the dead languages are employed. Learners are apt to be deterred by the fancied difficulty of recollecting hard words; but *dimorphum* is not harder than *dimorphous*, nor is *triquetrum* a more learned word than *triquetrous*. The real difficulty of botany (and the same may be said of any other branch of natural history) does not consist in remembering the name, but in determining the genus

and species. When a plant has been thoroughly examined and carefully compared with the description in a manual: when a specimen has been dried and put away with its proper label attached, there is little chance that the name will slip from the collector's memory, especially if the systematic name be the one employed. The English name may be a local or provincial, rather than a popular one, in which case error may be occasioned by the reappearance of the plant elsewhere with another title, or it may be liable to the objections stated above; whereas the Latin name is limited in its application and universally recognised.

Many of the Mosses are certainly difficult to be distinguished, owing to the minuteness of the characters on which generic and specific differences are founded; and this, I suppose, is the principal reason why so few persons form collections. Collections of Ferns, Seaweeds, Birds'-eggs, Postage-stamps, Crests, &c., are to be met with everywhere; nay, I have heard even of a choice collection of Luggage-labels. The facility of exchanging duplicates through the post has tended to make the present a collecting age. Yet a taste for collecting Mosses has never become popular, though they possess many attractive qualities: for example, there are a great number of kinds, and they are for the most part social in their habits, so that where one specimen has been found many more may be procured. They are universal in their distribution, inhabiting woods, fields, hedges, marshes, rivers, and walls. They are easily preserved, re-

quiring only a few days' pressure in blotting-paper. They are light and may readily be exchanged through the post. They are exquisitely beautiful, both in their fresh and dry states. When once dried they are liable neither to the attacks of mildew nor of insects, and may be preserved for an indefinite time unaltered in form, and but slightly so in colour; and they may after the lapse of any time be restored to apparent freshness by immersion in water. The single objection, then, which seems to lie against them is, that it is difficult to refer them to their proper species. But this objection is more apparent than real, and may easily be surmounted. Let anyone, who has a taste for natural history and an observant eye, gather a specimen of each of the commonest kinds to be found in his own neighbourhood, and having placed them between the leaves of some old book, subject them to a slight pressure. In a few days they will be dry. Let the collector then send them to some botanist of his acquaintance, with a request that they may be returned having attached to each a label bearing its systematic name. The specimens thus named should then be compared with the descriptions given in a Manual of the Mosses, their essential characters noted, and their names committed to memory. Suppose the number of species collected to be from twelve to twenty, these will belong probably to four or five different genera, quite enough to form a basis of operations. A comparison of the characters of the plant as they exist in nature with the printed descriptions will constitute

the first lesson in muscology, introducing the collector, now become a student, to a knowledge of the organs on which the generic and specific characters are founded, and he will in a short time find himself able not only to associate other species of the same genera with those which he possesses, but by the help of his manual to discriminate new genera as well, when they chance to fall in his way.

It is not every one, indeed, who can refer to a botanical *friend*, but any botanist conversant with the Mosses would be pleased at being asked to perform so simple a service as the naming of a score of Mosses, though the applicant were a stranger.

By acting on this plan it is surprising in how short a time the eye of even a novice may become familiarly acquainted with the common Mosses of a neighbourhood. The thorough exploration of a district demands, indeed, an extended research, and rarities may be long overlooked in the most frequented places of resort.

A few days since, I took a party of young collectors to a wood where I thought we should find one of the Mosses mentioned above, *H. triquetrum*, in fructification. This is the large stout Moss with upright stems and dark green leaves which is most frequently employed for decorations, and is offered for sale in Covent Garden Market stained with a variety of unnatural colours. The fructification, which rises from the side of the stem, consists of a delicate wire-like stalk, curved at the summit, and bearing a small

polished capsule or seed-vessel, shaped something like the head of a bird. We were successful in our search; but, observing among the Moss one capsule somewhat different in character from the rest, I traced it to its origin, and found that it belonged to another species, *H. piliferum*. This last is a very common Moss, but exceedingly rare in fructification; so much so, that though I have studied the Mosses nearly thirty years, and had seen the plant growing times unnumbered, I had never before found it in that state. Of course we searched for more, and succeeded in procuring as many specimens as we desired. That there is a charm in finding something new and unseen before, it were needless to say. The love of novelty ranges over a boundless field; but in natural history there is this special excitement, that something new may reveal itself at any time, and in a place where it is least expected. Last spring I met with another instance. I was on a visit at a friend's house in Staffordshire, and one morning, finding myself the only occupant of the breakfast-room, I walked into the garden for a few minutes. I strolled into a rockery made of huge masses of sandstone arranged in nearly the same order in which they had lain in the quarry. Stooping down to examine a minute vegetable production which at some little distance looked like grey mould, I found that a portion of the stone was thickly covered with a minute Moss (*Weissia trichodes*), which I had never before seen growing. Among it was creeping an exceedingly beautiful Jungermannia (*J. ciliaris*), and

within a few feet a minute and beautiful Moss (*Bryum androgynum*), neither of which I had seen for many years. I thus had an opportunity of improving my acquaintance with no less than three minute but engaging friends, in whose neighbourhood I had been spending several days without suspecting their existence.

Some of my readers will perhaps smile at my recommending, as another amusement for the country, the formation of a collection of land and fresh-water Shells. This pursuit, they may think, will very soon come to an end; three or four kinds of land-snails and as many of water-snails will complete the collection. The country in the neighbourhood of my own house happens to be not very rich in this department of the Fauna, at least such was my impression; so, it having occurred to me that my pupils might find out-of-door amusement and occupation in collecting all that were to be found within three miles of home, I offered a small prize for the best collection that should be made, provided that it contained not less than twenty-five species. At the expiration of a year I was called upon to adjudicate, when the successful competitor exhibited upwards of fifty species, all correctly named, and neatly gummed to small hexagonal pieces of wood covered with pink or green paper.

To the question, 'What is the use of making such a collection?' I might make an extended answer. Let a brief one here suffice. It is by the presence or absence of Shells identical with or allied to

existing species, that geologists are enabled to assign the relative dates of the tertiary rocks.

The Mosses have no such subsidiary use; yet the power of discriminating the various species one meets with during a walk is well worth the trouble of acquiring, from the simple consideration that it is accompanied by intellectual gratification. My own neighbourhood is even less productive of Mosses than of Shells; yet a collection of named Mosses, to which on another occasion I awarded a prize, contained upwards of eighty species. And here, again, should anyone ask, 'Do you consider the time profitably employed which is devoted to such pursuits by young people, whose occupation it ought to be to store their minds with the knowledge which will be of use to them in after-life?' My answer is, 'Decidedly yes.' The mind which has taught the eye to distinguish in a bed of Moss half a dozen specific forms, has itself, during the process, acquired a discriminating power which will, from that time forward, be exercised on all objects presented to it, and will never be lost. The generic and specific character of Mosses, it is admitted, are minute, and cannot be distinguished without an expenditure of much time and care; but if children can be induced to take pleasure in an occupation which requires patient attention, surely they are not wasting time, even if the subject be in itself without value. All the visible results of their labours may be a handful of green sprigs; but the mind which has been at work in determining species, and arranging them systematically, has acquired a

habit of exactness which must of necessity be exercised on other and more important subjects. The boy who, during a country-walk, has found occupation in learning how to distinguish between *Hypnum loreum* and *H. triquetrum*, will have his faculties in better order for parsing a grammatical sentence than his companion, who impatiently spent the same time in beating down nettles with his walking-stick.

Such is my experience, and, in evidence, I could point to the successful competitors for the prizes awarded to the best collections of shells and mosses, having since achieved distinction in a rivalry where intellectual superiority is tested by reference to higher subjects; but where, nevertheless, the minute exactness acquired during the process of examining organised structure is of incalculable service.

### *'Bleating' of the Snipe.*

The characteristic note of the Snipe, which has received this name, is thus described by Yarrell, quoting Selby:—'These calls are always uttered upon the wing, and consist of a piping or clicking note, often repeated, and accompanied at intervals by a humming or bleating noise, not unlike that of a goat, apparently produced by a peculiar action of the wings, as the bird, whenever this sound is emitted, is observed to descend with great velocity, and with a trembling motion of the pinions.'

Recent observation tends to show that this statement is inaccurate.

The male bird, it is now known, sometimes perches

on a tree, and Toussenel states that he has twice shot male birds perched on the top branch of an oak which stood in a marshy meadow of the Val-de-Loire. M. Toussenel adds, that the birds, when he shot them, were making the bleating noise described above; and several writers in the 'Zoologist' assert that they have heard the same note proceed from the bird while perched on the ground. If this be so, the commonly received opinion that the noise is caused by the vibration of the wings while the bird is in motion through the air, cannot be entertained. The fact that it occurs only during the season of song, for it is never heard in winter, seems to favour the idea that it is a plain song of the bird, not more singular, after all, than the whirr of the Night-Jar or Grasshopper Warbler.

## *Gulls.*

To many lovers of the sea, birds are perhaps unimportant accessories to marine scenery: the unbounded expanse affords sufficient enjoyment in itself. Yet there are many who, without knowing anything of ornithology, or caring either to distinguish the species or observe the habits of birds, find their enjoyment much heightened by the presence of sea-fowl.

Day after day the same scene stretches out before them; but every day brings its own change. Now green and bright, now blue, murky, calm, rippled, billowy—under no circumstances does the sea suggest an idea of lifelessness; yet the presence of a single

bird introduces a new feature, that, namely, of active moving animal life. That the ocean is inhabited by fish we doubt not—that it affords a home to birds we see, and the actual sight of the one white-winged bird charms us more than all the marine animals in whose existence we merely believe. That one bird which thus peoples the sea will most likely be a Gull, and if there be a large flock, that will in all probability be composed mainly of the same birds.

As, among land birds, the common Thrush and the common Skylark are more precious than the greatest rarities; so, on the sea-shore, the Gull occupies a place which would not be so well filled by any other sea-bird, were it even so rare as the Great Auk, the appearance of which is recorded by naturalists as duly as that of a comet by astronomers. Gulls claim no such distinction as the *rara avis* just mentioned; they are to the sea what stars are to the winter sky. If these are present, be it ever so cold or stormy, we call it a 'fine night;' otherwise it is 'gloomy,' as a wood would be in spring without its Thrushes, a meadow without its Skylarks, or the sea without its garniture of Gulls.

I was walking this morning with a friend along the shore of Whitsand Bay, Cornwall, when we remarked to one another the exceedingly great elevation attained by a party of three or four Gulls over our heads, which were flying seawards. They were too high to allow their colour or form to be distinguished, but the specific beat of their wings left no doubt as to what they were. While we were

watching them, one of them suddenly altered its mode of flight. Instead of urging its way onwards, it began to describe a series of circles in the air, descending all the while. All at once its wings seemed to be paralysed; but one or two ineffectual flappings followed, it dropped like a stone, and fell on the sand into the shallow water left by a receding wave. We rushed forward to solve the mystery, and had no difficulty in securing it before it could be carried off by another wave, for it was dead. Not a feather was ruffled; not a scar could we discern on its body; but a drop of blood which hung from the beak led us to suppose that it had died of internal hæmorrhage. Such proved to be the case. On being dissected, its death-warrant was discovered in the form of a single shot, which it had probably received far inland. My friend had the bird stuffed, and I never visit his richly-furnished museum without moralising on the fate of the poor bird that, mortally wounded at a distance from its watery home, expended all its remaining strength in the effort to return once more to its stronghold, but dropped dead on the boundary line of the sea.

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